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ABSTRACT

This directory contains descriptions of 44 National Diffusion Network (NDN) programs that have been validated by the Joint Dissemination Review Panel of the Department of Education and make use of technology. The programs are organized into three sections. Section I describes 11 Lighthouse Projects in the areas of administrative processes/management; computer literacy and programming; computer-assisted instruction (CAI) for teaching secondary math, reading and math for grades 3 through 8, basic skills, adult education, in-service teacher training, and accounting; development and test approaches to telecommunications; computer-managed instruction (CMI); occupational training; special education; and K-8 computer literacy education. Information given for each project includes a program description, the technology used, sources of available software, services provided, and a contact name for additional information. Sections II and III describe 24 NDN-funded developer demonstrator projects and nine unfunded validated projects in the areas of basic and computer literacy; basic skills; career education; occupational education; CMI; a computer-assisted diagnostic-prescriptive program for underachievers; use of amplification technology as an instructional technique; cash flow forecasting; mass media services; and economic education. Information provided for each project includes a program description, evidence of its effectiveness, implementation and financial requirements, and services available at each site. NDN State Facilitators are listed, and title, geographical, and ERIC descriptor indexes are provided. (DJR)

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Technology Programs That Work

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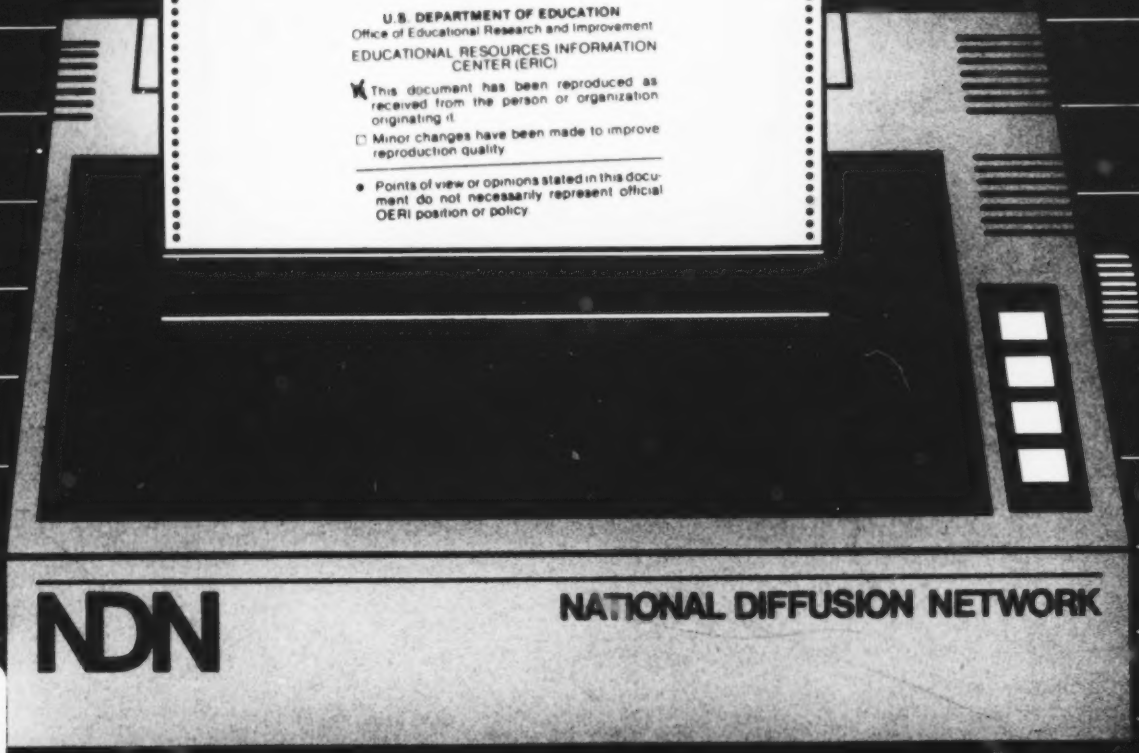

NDN NATIONAL DIFFUSION NETWORK

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TECHNOLOGY PROGRAMS THAT WORK

Michael B. Webb, Editor

Technology for the NDN Project
Institute for Urban and Minority Education
Teachers College, Columbia University
New York, New York

December 1984

This directory was developed by the Technology for the National Diffusion Network Project, Teachers College, Columbia University pursuant to Contract Number OE-300-83-0253, U.S. Department of Education. The contents do not necessarily reflect the views or policies of the U.S. Department of Education or Teachers College, nor does mention of trade names, commercial products or organizations imply endorsement by the United States Government or by Teachers College.

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M.W.
New York, N.Y.
December 1984

FOREWORD

Technology Programs That Work is a product of the *Technology for the National Diffusion Network Project*, funded by the U.S. Department of Education (OE-300-83-0253), under contract to the Institute for Urban and Minority Education, Teachers College/Columbia University, New York, NY.

The mission of the *Technology for the NDN Project* is to computerize NDN reporting procedures, provide technical assistance in technology to NDN projects and staff, and establish computerized communications throughout the NDN. The Technology Project collects and combines data submitted by NDN Developer/Demonstrators and State Facilitators to create a database describing adoptions of NDN projects nationally each year. The Project also helps Developer Projects in technology to disseminate their programs more effectively to schools across the nation. It pays special attention to the Lighthouse Projects which were created by the NDN to increase technological know-how in school districts on all levels—for management, communication, and instructional purposes. The Lighthouses receive assistance in the areas of dissemination, program management, and evaluation.

The *Institute for Urban and Minority Education* (IUME) is a research, development, service and information dissemination agency committed to human resource development through the improvement of education in urban areas, particularly of ethnic and racial groups. It is sponsored by Teachers College/Columbia University, and by government and private agencies. The Technology for the NDN Project is part of the IUME Division of Dissemination, Communication, and Development.

Teachers College, the graduate school of education of Columbia University, is dedicated to the systematic advancement of the sciences and arts associated with the educating, psychological, and health service professions. Concerned with teaching, learning, and the promotion of mental and physical well-being across the entire lifespan and in varied situations and institutions, the College prepares men and women for careers of professional service in schools, colleges, universities, clinics, hospitals, day-care centers, business organizations, community agencies, government bureaus, and research facilities.

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INTRODUCTION

Technology Programs That Work contains descriptions of National Diffusion Network programs that have been validated by the Joint Dissemination Review Panel of the Department of Education and that make effective use of technology.* Approval by the Panel indicates that a program has formally submitted evidence that it has met its stated objectives at the original development or demonstration site.

The National Diffusion Network (NDN) is committed to assisting local, state and other agencies and institutions in their efforts to identify, develop and implement effective educational practices. Toward this goal, the NDN provides support through State Facilitators—one or more individuals in each state who help to identify suitable NDN programs and who assist with adoption, training and operation. The NDN also provides support through Developer Demonstrators (D/Ds), exemplary projects which receive Federal funds to provide training, materials, and other assistance to those adopting their programs. State Facilitators represent an important link between D/Ds and those seeking new ideas. Facilitators can be contacted for additional information on any program described in this directory. A list of State Facilitators appears at the end of the directory.

Forty-four programs are described in the following pages. The programs are organized into three sections: 1) Lighthouse Projects; 2) NDN-funded Developer Demonstrator Projects; and 3) Unfunded, Validated Projects.

Alphabetical, Geographical and ERIC Descriptor Indexes are included at the end of the directory. The ERIC Descriptor Index identifies the emphasis of the programs based on the population for which validation was awarded, technology emphasis, and specific subject content addressed. It should be noted that, while programs were validated for their activities in working with specific groups, most continue to develop new applications to serve wider populations. Lighthouse Projects have not been indexed according to the population served, since the purpose of these projects is to serve a diverse audience.

*For descriptions of other NDN programs, consult the tenth edition of *Educational Programs That Work, 1984.*

SECTION I

LIGHTHOUSE PROJECTS

The NDN Lighthouse, a relatively new concept, originated out of the need to share information and experiences related to the great technology explosion in education. Each Lighthouse Project has a history of helping school districts to use technology effectively.

Lighthouse Projects fulfill multiple roles in providing awareness materials and information, training programs, technical assistance and appraisals of trends in technology, and in acting as helpful, reliable sources of information. All are funded as Developer Demonstrators and receive supplementary funding to support expanded demonstration activities and services. Lighthouse Projects are capable of replicating their programs in interested school districts.

Lighthouse Projects help to expand the overall services of the NDN by offering a setting in which educators and decisionmakers may observe, identify, question, test, and discuss a wide variety of technology applications.

ALMA COMPUTER LITERACY LIGHTHOUSE

Alma Public Schools

GENERAL DESCRIPTION

Through its Lighthouse Project, the Alma Public School District has accepted the challenge and responsibility of sharing its experience and knowledge of microcomputers in all facets of education. Computers are used district wide to teach subject matter at every grade level using a wide variety of software and many different approaches. The district also operates the NDN-validated Computer Literacy Project. The primary emphasis of the Alma Lighthouse Project is to provide administrators, teachers involved in computer courses, and teachers involved in computer assisted instruction the opportunity to observe, experience and discuss numerous applications and uses of technology and microcomputers.

TECHNOLOGY

The Alma Lighthouse Project makes use of various computer hardware and software. The district operates a large number of Commodore microcomputers as well as a full range of computer peripheral devices including card readers, tape drives, disc drives, modems and printers. Although new applications are being implemented continually, Lighthouse uses of microcomputing include a focus on:

- administrative processes (fiscal accounting, inventory, student scheduling, student attendance, grade reporting, school elections, athletic scoring, occupational awareness, inter-agency communication),
- teaching about computers (computer literacy, computer programming); and
- using computers to teach subject matter (drill and practice, remediation, problem solving, enrichment).

RESOURCES

The Lighthouse Project has available for distribution software and printed materials in the areas of computer literacy syllabi, computer science syllabi, administrative microcomputer applications, and instructional software in various subject areas. Much of the applications software has been developed locally. Other available software includes both student made and commercially developed applications.

SERVICES

The Lighthouse Project is prepared to provide services ranging from telephone consultations to in-depth training sessions. Visitors are welcome to informally view general or specific applications in use.

The Lighthouse Project offers educators and decisionmakers from around the country assistance in planning, designing and implementing computer technology programs. Formal workshops—on site or elsewhere—provide for an overview of microcomputers in education, observation of educational computing taking place, and planning issues relating to specific, computer-related projects and activities. The project is prepared to tailor demonstration workshops and consultation to the specific interests of participants, to refer participants to other resources, and to follow up on concerns that are raised.

The project also welcomes telephone or in person consultations on educational computing issues.

CONTACT

David Woolly, Lighthouse Coordinator
Alma Public Schools
P.O. Box 1018
Alma, AR 72921
(501) 632-4791

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ASBURY PARK LIGHTHOUSE PROJECT

Asbury Park Public Schools

GENERAL DESCRIPTION

The Asbury Park Lighthouse provides support in administrative and instructional applications of technology. The Lighthouse, a demonstration and technical assistance center serving state and local educational agencies, utilizes area high schools, middle schools, elementary schools and dedicated computer facilities to develop and test approaches to telecommunications, computers, robotics and other technologies.

Asbury Park operates a validated program in secondary level mathematics—Utilizing Computer-Assisted Instruction—as well as a remedial middle school mathematics program. The Lighthouse can assist school districts in making decisions about the instructional and administrative use of computers, including financial and accounting systems, attendance and grade reporting, scheduling, selection of hardware, curriculum development, and staff inservice.

TECHNOLOGY

The Lighthouse operates two NCR criterion mainframe computers, Hewlett-Packard minicomputers and more than 40 microcomputers—Apple II+, TRS-80 Model III, IBM, NCR DM5, and DEC Pro. Peripheral devices, including optical scanners, key punch machines, card readers, tape drives, disc drives, modems, printers and specialty terminals are also maintained. Asbury Park makes considerable use of video technology, both for school-based programs and technical assistance and training. The Lighthouse uses onsite satellite antenna facilities to provide news and educational telecommunications programming to local schools. High school students have an opportunity to participate in robotics technology using assembly language to program the Heathkit Hero I Robot.

RESOURCES

Locally developed and commercial software, designed to operate on mainframe, mini- or microcomputers cover many administrative and instructional applications. Other available resources include a middle school computer lab, a high school mathematics computer lab, a high school business computer lab, two administrative data processing centers, and eighteen telecommunications processors. Video tapes containing awareness material are available for workshop participants.

In addition, the Lighthouse maintains a computer library that features manuals for the validated mathematics program, software, computer program implementation guide, and general reference material documenting existing technology programs and activities. Specific documentation includes courses in keyboarding, word processing, computer literacy and computer science.

SERVICES

Visitors can participate in demonstrations of telecommunications, robotics, and computer technology. Demonstration programs include a general presentation, needs assessment, and targeted consultation. Needs assessment activities assist educators in making decisions about their primary computer application needs. Consultation includes a focus on planning and support activities necessary to implement technology applications such as staff inservice, curriculum development, and selection of equipment and software. Project staff are prepared to assist educators in decisions concerning cooperative services among districts, including cooperative use of telecommunications and computer networks.

CONTACT

Mrs. Judy Smith
District Supervisor for Instruction
Asbury Park Board of Education
Asbury Park, NJ 07712
(201) 776-2619

CALIFORNIA LIGHTHOUSE PROJECT

Education and Technology Foundation

GENERAL DESCRIPTION

The overall goal of the California Lighthouse Project is to stimulate the use of technologies in school-based programs. The Project is a "Lighthouse without walls," providing services and resources through a network of validated state programs and the California Teacher Education and Computer Centers. The Lighthouse draws upon California's role as a leader in technology to disseminate information to educators on promising technology practices and policies occurring throughout the State.

California Lighthouse in collaboration with the State Facilitator assists districts throughout the State to identify and adopt NDN exemplary programs and practices developed nationwide. In this way, the Lighthouse acts as a linking agent between NDN programs and local California school districts.

TECHNOLOGY

As a linking agent for technology and NDN programs throughout the State, the California Lighthouse can facilitate demonstrations of technologies currently used in school programs. Based upon interest, the Lighthouse can arrange visitations to sites employing specific technologies in conjunction with instructional, administrative and management objectives.

Videodisc technology is available for demonstration. The Project also makes use of the Far West Laboratory for Educational Research and Development Educational Technology Center for demonstrations of microcomputing.

RESOURCES

California Lighthouse acts as a clearinghouse for services and materials developed Statewide. The Project seeks to provide educators and administrators with up-to-date information on availability, cost, and effectiveness of technology resources within the network of California NDN projects, and State Teacher Education and Computer Centers.

The Lighthouse makes available student workbooks and teacher manuals of the validated mathematics program, MICROMATH and a BASIC workbook. The Project has produced a technology resources directory and a guide for product development and documentation.

SERVICES

Through a variety of services, the California Lighthouse Project can help educators to make decisions about policy, planning and funding related to technology initiatives. The Project provides assistance to projects in the development of documentation required for validation and dissemination.

California Lighthouse sponsors training activities in the format of specialized workshops (on request) and a Summer Institute. Specialized workshops, onsite or in the field, focus on computer programming, curriculum/technology planning, use of specific software packages and training in the validated mathematics program, MICROMATH. The Summer Institute is designed for teachers, teacher trainers and curriculum specialists.

CONTACT

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California Lighthouse Project
Education and Technology Foundation
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San Francisco, CA 94103
(415) 626-3070

CAM LIGHTHOUSE PROJECT

Hopkins Public Schools

GENERAL DESCRIPTION

The CAM Lighthouse Project demonstrates and provides training on applications of computers for the systematic management of instructional processes, for key administrative uses and for classroom instruction covering many content areas and levels. The project operates an NDN-validated computer assisted instructional management systems project. A unique feature of the Lighthouse is the emphasis on the management of instruction. Nearly fifteen years of experience in educational computing provide the Project with a broad perspective from which to assist local schools in decisionmaking relevant to applications in technology. CAM has experience in acting as a collaborative partner with other school systems in various computer activities.

TECHNOLOGY

The project makes use of mainframe computers for some administrative applications and as part of activities of statewide and local computer consortia. CAM applications are designed for Apple II+/IIE microcomputers of which there are more than 160 district wide. A limited number of Texas Instrument microcomputers are also used for applications of LOGO.

Software comes from four main sources: locally developed, commercial, Minnesota Educational Computer Consortium (MECC), and Total Information for Educational Systems (TIES). Software includes a revised CAM version for group-paced and/or individualized settings, and the newest version, Mastery Management. ASSIST is another software system developed by CAM for special education tracking and management. CAM has developed and operates a computer-based instructional management system that provides course objectives data to teachers and students after each test taken.

RESOURCES

The CAM Lighthouse Project utilizes ten separate locations, including a large central office, six elementary schools, two junior high schools and one high school. Visitors can see demonstrations of various computer equipment and software applications at each location. The Lighthouse has extensive documentation available for all computer applications that are demonstrated. The computer library includes software, program documentation, teachers' manuals, books, periodicals, information on nearby computer hardware companies (Honeywell, Control Data and Sperry Univac) as well as documentation of local and statewide computer consortia. Much of the software used by the project can be purchased through the Lighthouse Project.

SERVICES

Visitors can see demonstrations of the CAM validated program, a new mastery management system, a variety of administrative applications, special education management systems, consortium student data bases and a wide range of classroom instruction applications. Structured workshops are designed for balance among presentation, demonstration and consultation. Staff conduct needs assessments based on the computer applications concerns of visitors. Technical assistance, consultation and library access are available to those attending workshops. Customized demonstration programs are also offered, based on the interests of particular groups. Individualized training is available in all educational computer applications used by the project. Visitors may also arrange to meet with persons involved in local and statewide educational computer consortia or representatives from cooperating computer manufacturing and service industries.

CONTACT

Donald Sension or John Erickson
The CAM Lighthouse Project
Hopkins Public Schools—1001 State Highway 7
Hopkins, MN 55343
(612) 933-9230

COFFEE LIGHTHOUSE PROJECT

Oxford Public Schools

GENERAL DESCRIPTION

The COFFEE Lighthouse Project provides a diversified approach to applications of technology based on the combined experiences and resources of project professionals, participating schools and cooperating industries. The Lighthouse demonstrates how a small rural school district has developed a broad computer technology instruction and management system by reaching out to local businesses and industries. Lighthouse activities focus on the areas of occupational training, administrative management, and instruction. One important feature of this Lighthouse is an emphasis on technology applications designed to meet the specific needs of special groups including gifted and disadvantaged populations. The Lighthouse currently maintains cooperative relationships with 63 firms in the private sector and 12 major colleges and universities. Of particular interest is the public domain/private sector collaboration between the Oxford Public School System and Digital Equipment Corporation that has resulted in additional physical and human resources to support the Lighthouse Project's activities.

TECHNOLOGY

The Data Processing Center houses a Digital VAX 11/750 computer and a Digital PDP-11/34 minicomputer with cartridge disc drives, magnetic tape discs, and a time sharing communication network. The Data Processing Center also employs a diverse array of video and hard copy terminals including Digital Gigi color graphics monitors. Other peripherals include graphic high speed and letter quality printers, mark sense card readers and word processing units. The computer system supports several computer languages including BASIC, PASCAL, COBOL and Fortran. Several types of microcomputers are also used at each of the school sites.

RESOURCES

Visitors can make use of the computer resource library located at the Data Processing Center, housing books, periodicals, guides and other print resources. An extensive collection of programmed training materials, video tapes and interactive video disc systems is also housed in the library. A growing collection of selected reprints from journals is maintained to augment this resource base. The project has acquired a collection of software developed from four main sources: developed by the project, students, collaboratively with the Digital Equipment Corporation or purchased.

SERVICES

The COFFEE Lighthouse Project offers visitation programs, workshop sessions and training programs on the following topics: occupational education in high technology, teacher education in computer technology, computer-assisted instruction, computer camps/clubs, mobile computer laboratory, hardware and software evaluation, adult and community education in high technology, computer technology programs for the gifted and talented student, computer literacy, industry/education initiatives, and computers as an administrative and management tool. Visitors can participate in demonstrations of a variety of software or can attend frequently conducted demonstrations of the validated alternative occupational program in high technology designed for alienated/disaffected high school-aged students.

The Lighthouse has the capability of assisting school districts in conducting high technology needs assessments from the kindergarten through adult education levels. Inservice and graduate level workshops are conducted for teachers and other school professionals. Programming staff are available to help make conversions of software to meet specific hardware requirements. In addition, technical assistance and consultation are available by appointment.

CONTACT

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COFFEE Lighthouse Project
Oxford Public Schools
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Oxford, MA 01540
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CUE LIGHTHOUSE PROJECT

Central Square Central School District

GENERAL DESCRIPTION

CUE Lighthouse Project, building on the resources of the validated program in compensatory education, provides training and consultation in computer-assisted instruction reading and mathematics programs for grades 3-8. The Project can assist schools, districts and individuals to develop management systems for compensatory education in the areas of recordkeeping, monitoring student progress, and reporting based on state and local guidelines. The Project can also assist in the development or adaptation of computer software for instructional programming. In addition, the Project can help educators to develop computer-based instructional and management plans and systems in areas not related to compensatory education. CUE utilizes elementary, junior and senior high schools, the local airport, a local college, and area businesses to demonstrate instructional and administrative applications of computer technology.

TECHNOLOGY

Various computer technologies support administrative and instructional processes throughout the district. On line terminals at various sites are coupled by phone modem or by a multiplexer to a HP2000 and a IBM mainframe computer located at Syracuse, New York. Microcomputers are used in conjunction with network systems as well as for specific school or site-based applications. Microcomputers are also used to support the functions of elementary and secondary school library/media centers. Microcomputers in use include Apple II/IIe, Franklin and TRS-80 IV models.

RESOURCES

The training manual of the validated compensatory education program is available as a resource for reading and mathematics programs. Curriculum materials, including software and teacher utilities, for reading and mathematics are also available. CUE has developed curriculum materials for introducing teachers and students to general microcomputer use, including *Teach With/Teach About*, a resource for teaching students about computers (K-12). The district maintains a high school computer lab that is utilized for applications in business subjects. Other resources include the Minnesota Educational Computing Consortium (MECC) software collection, computer magazines, software related to instructional and administrative uses, and documentation for microcomputer-based management systems.

SERVICES

Training programs are offered in computer literacy, implementation of the compensatory education program, evaluation and selection of software, and in specific instructional applications designated by participants. CUE can help educators to develop computer awareness/literacy curricula or computer science electives in specific subject areas or targeted to special applications including graphics, special and gifted programs, business education, and word processing courses. The Project also provides assistance in developing long and short range plans for computer use within a school system, emphasizing needs analysis, costs, schedules, facilities planning, inservice, and information support systems. CUE can aid in decisions concerning software selection such as specifications planning and bidding, and can help to identify resources for developing local collections of commercial and locally-produced documentation and materials, including MECC and public domain software.

Visitors can participate in tours of district schools. State-of-the-art computer technology can also be viewed at local business and service entities including the Radio Shack Learning Center, Air Traffic Control at Hancock Airport, the IBM Product Center, and Wang Labs, Inc.

CONTACT

Mrs. Christine Gilbert, CUE Trainer
Mrs. Carol Heiselman, Director
Central Square Central School District
District Offices—Main Street
Central Square, NY 13036
(315) 668-2611

CUPERTINO CONCEPT: COMPUTER LITERACY LIGHTHOUSE PROJECT

Cupertino Union School District

GENERAL DESCRIPTION

The Cupertino Lighthouse provides assistance to instructional leaders, staff development trainers and teachers in the implementation of the Computer Literacy Project, designed to increase opportunities for students to become computer literate. While the Project has been validated by the JDRP as a comprehensive K-8 computer literacy curriculum, the model for establishing and maintaining the Project is appropriate for all grade levels. The Project strives to provide a program for diverse student populations and includes applications designed for handicapped, disadvantaged and preschool children.

The Cupertino Union School District benefits from liaison with business and industry. The District serves as a pilot for numerous software and hardware developers.

TECHNOLOGY

Each elementary school in the District houses at least five Atari 800, two Apple+ and one Apple IIe microcomputers. The computers are integrated into the instructional program, used for administrative purposes and are made available to teachers and parents during nonschool hours. Two of the junior high schools have Apple microcomputer labs that include sixteen microcomputers used for instruction. The other two junior high schools in the District have Atari labs equipped with sixteen Atari microcomputers. The central office utilizes a PRIME minicomputer for clerical, personnel and business purposes. Competency testing in the District is managed by microcomputers and card readers. District schools have also incorporated robotics and other devices into their computer literacy programs. Big Trak, Topo and Fred are familiar entities in the elementary schools that help children learn in innovative ways.

RESOURCES

Specific resources include documentation for project implementation and management, staff development, administrative guides outlining legal and ethical issues involved in the use of computer hardware and software, short and long range computer program planning materials, K-8 computer literacy curriculum with various implementation models, computer software inventory and evaluation materials, and documentation for management systems for utilizing microcomputers and the PRIME minicomputer. Various instructional support materials are also available.

SERVICES

The Lighthouse can assist teachers and administrators to develop comprehensive implementation plans for computer literacy programs focusing on:

- short and long range goal formulation
- curriculum development
- installation of computer labs
- staff development
- training of trainers to provide for inservice targeted to teachers, aides, parents and administrators
- maintenance and security procedures

In addition, the Lighthouse makes available opportunities to visit computer literacy program demonstration sites throughout the district, as well as other sites utilizing specific technologies.

CONTACT

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Cupertino Union School District
10301 Vista Drive
Cupertino, CA 95014
(408) 252-3000 (ext. 286 or 216)

MERRIMACK EDUCATION CENTER TECHNOLOGY LIGHTHOUSE PROJECT

Merrimack Education Center

GENERAL DESCRIPTION

A major focus of the Merrimack Education Center Lighthouse is to provide assistance necessary for carrying out large-scale implementation of computer-assisted instruction or computer literacy objectives. Working with State and other leadership and dissemination personnel, state-wide models of computer implementation have been developed for school districts using computers or other interactive technologies. The project has also worked with planning personnel to develop technology applications for adult education, special education and Chapter 1 basic skills programs. The Lighthouse's location, in the high technology area of Massachusetts, places the Center in proximity to technology firms in the private sector. The Center works with several firms to bring about cost-effective purchasing services for schools. The Center also coordinates credit courses for teachers and administrators through the masters degree level.

TECHNOLOGY

The Lighthouse uses computers to support extensive networking activities as well as for specific, school-based instructional and administrative applications. Minicomputer systems are used for networking involving microcomputers located at multi-district sites and a central processing unit housed at the main facility. Microcomputers, housed at the technology facility, central administrative facility and in district schools include the Apple II, TRS-80, Commodore Pet, DEC, IBM, SONY, Atari 800 and Texas Instruments models. Each of the systems is equipped with a complement of peripheral devices to support word processing, spreadsheet, and graphic applications. State-of-the-art video disc technology is also demonstrated at the Computer Learning Center along with online data bases.

RESOURCES

The Lighthouse has developed a comprehensive process for planning and implementing district-wide computer programs with six components—planning, hardware, courseware, training, applications, and implementation support—each with several services that can be selected individually or as a total package. Various documentation of the validated computer-assisted instruction (CAI) program is available including a longitudinal evaluation and executive summary. Curriculum manuals describe CAI options for mini- and microcomputers.

All major vendors make computer software available for teacher preview and demonstration at the technology site. Lighthouse holdings include the Minnesota Educational Computing Consortium (MECC) collection, software for use in compensatory education programs, software for mathematics, calculus, statistics, and management, and teacher manuals, books and periodicals. Computer searching of ERIC and other data bases is also available.

SERVICES

The project's computer applications planning seminars (CAPS) build upon a highly successful model for comprehensive district-wide planning encompassing such concerns as identification of key personnel, budgeting, staff development, initiation of pilot programs, and evaluation. Lighthouse services are conducted on site and in the field. Demonstrations are conducted on specific computer applications. Training programs, based upon the assessed needs of participants, focus on computer literacy, word processing, graphics, LOGO, BASIC, PASCAL, and administrative uses of microcomputers. The Lighthouse sponsors a series of Leadership Institutes and inservice programs to aid personnel in software review, selection and evaluation. A software subscription service is available through the Lighthouse Project. Subscribers are able to preview available software and to participate in a software exchange program.

CONTACT

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READ:S LIGHTHOUSE PROJECT

Coeur d' Alene Public Schools

GENERAL DESCRIPTION

The major focus of the Project is to provide individually tailored demonstrations of computer-assisted instruction. The emphasis is on programming that is cost-effective while incorporating state-of-the-art microcomputer-assisted methodologies. The project incorporates a number of sites, all of which support demonstrations of technology applications: central office and library, junior high school computer laboratories, high school computer laboratories, an alternative high school, Chapter 1 programs in eleven schools, and classroom sites in thirteen schools, K-12. The validated READ:S Project contains components for inservice teacher training in all content-areas, for the development and production of instructional materials and activities, and for the direct instruction and reinforcement of vocabulary, reading comprehension, and study skills using microcomputer technology.

TECHNOLOGY

The READ:S Lighthouse Project utilizes TRS-80, Apple IIe and Psychotechnics 360 microcomputers. Each of the systems is equipped with peripheral devices such as disk drives, printers, and phone modems. Approximately 130 microcomputers are currently being used within the Coeur d' Alene Public School System.

Authoring diskettes enable users without any previous computer programming skills to create their own Project READ:S comprehension modules using the specific content they wish to teach or to support.

RESOURCES

The central office library contains awareness and training materials and lesson plans for the validated READ:S project, including a set of software containing Project READ:S sample modules and authoring diskettes for those schools equipped with either the TRS-80 or Apple IIe microcomputer systems. Also available is an array of software in the areas of computer-assisted instruction, word processing, computer laboratory usage, and administrative applications. The Lighthouse is a member of the Minnesota Educational Computing Consortium with its entire library of software. The Project CABLE (Computer Assisted Basic Learning Experiences) newsletter is produced quarterly.

SERVICES

Services available from the Lighthouse include microcomputer demonstrations and workshops in curricular areas of particular interest to participants either on site or in their districts, and training based on the validated READ:S reading in the content areas curricula for grades 7-12.

The Lighthouse Project also offers demonstrations of numerous, low budget, highly successful microcomputer applications currently in place in the Coeur d' Alene Schools, including a three level, senior high school mathematics curriculum; a word processing curriculum for junior and senior high school students; a microcomputer-assisted instructional and management curriculum for learning disabled, visually impaired, mentally handicapped, and gifted/talented students; a diagnostic/prescriptive reading curriculum and management system for Chapter 1 students; a career education project; a junior high school microcomputer augmented laboratory curriculum to support all content areas; an alternative high school; an elementary level microcomputer literacy project; a teacher education curriculum in microcomputer technology; fixed and mobile microcomputer labs; an adult education curriculum in microcomputer literacy and programming; and a summer school curriculum with microcomputer-assisted instruction in reading, math, office practice, word processing and composition.

CONTACT

Lynn Dennis, Director
READ:S Lighthouse Project
311 North 10th Street
Coeur d'Alene, ID 83814
(208) 664-8241

RECIPE LIGHTHOUSE PROJECT

Sarasota County Public Schools

GENERAL DESCRIPTION

While the general aim of the RECIPE Lighthouse Project is to make a wide variety of information on technology-oriented programs available for visitors to review, the Project places special emphasis on applications in areas related to Special Education. In addition to the NDN-validated RECIPE materials which focus on computer-generated Individualized Education Programs and Progress Reports, visitors may review and receive information on the following topics: Comprehensive Exceptional Student Data Management Systems; Hardware/Software Modifications for Exceptional Students; Software Evaluation; Integration of Computer-Based Programs into the Special Education Curriculum; Computer Literacy for Teachers and Students; Mainframe Computer Management and Data Processing; and Future Trends in Video Disc Technology.

TECHNOLOGY

Hardware configurations which may be viewed by visitors and which are used for various Lighthouse activities include Apple, Radio Shack, and IBM microcomputers. A NCR 8555 model mainframe computer—with LA 3600 remote terminals and SCANTRON 2000 interface in each of 31 school sites—is employed by the Data Processing Department for applications in the areas of budgeting, attendance, inventory, food service management, and personnel management. Chapter 1 and Compensatory Education programs are currently operating 10 microcomputer networks at the middle school level for remediation instruction with approximately 1200 students. A Pioneer Interactive Video Disc System is also housed at the Lighthouse and is used for demonstrations. This system has been used in middle school music education and appreciation classes.

RESOURCES

The Lighthouse currently maintains collaborative relationships with several NDN, State, and local technology projects and organizations. As a result of these relationships, a sharing of resources on a variety of technology issues is possible. Examples of these resources include:

- an extensive collection of research and reviews on computer based instructional materials made available through Sarasota County Media Department.
- demonstrations of hardware and software modifications for handicapped students through Project CAISH (Computer Assisted Instruction and Support for the Handicapped).
- a hard disk TRS-80 Exceptional Student Education management system developed by the private sector in conjunction with several Florida school districts.
- a large collection of technology journals and trade publications available for visitors to review.

SERVICES

Structured workshops of one or more days at the Lighthouse site in Sarasota are available, based on the needs and interests of potential visitors. Normally, a two day visit is scheduled with the first day of activities devoted to an overview of computer applications in Special Education and the second day of activities centering on computer programs for regular education. However, the second day can also be structured for more extensive training in a particular area.

CONTACT

Sanders Bell, Lighthouse Director; or
Priscilla Cady, Training Specialist
School Board of Sarasota County
1001 South School Avenue
Sarasota, FL 33577
(813) 957-3899 or 953-5000 (ext. 141)

VANCOUVER LIGHTHOUSE PROJECT

Vancouver School District

GENERAL DESCRIPTION

The Vancouver Lighthouse Project emphasizes private sector, community, and volunteer involvement in programs and services incorporating computer technology. The project offers various levels of assistance in the areas of mainframe computer accounting, administration and management, teacher training in computer literacy, high technology training in mathematics and science and computer-assisted instruction. The District operates two nationally-validated mastery learning programs in reading and math, that have been implemented in over 300 schools nationwide. Other microcomputer applications have focused on alternative schools, summer computer camps, gifted programs, electronics, music, and cooperative community cable vision programs. Because the Vancouver School District utilizes computer-based programs district-wide, multiple computer applications can be demonstrated in all grade levels and in many instructional and administrative areas.

TECHNOLOGY

The Vancouver School District operates its own mainframe computer which serves diverse management functions. Over 400 microcomputers including many different models are in use throughout the district. In addition to computer literacy and computer-assisted instruction materials, documentation is available for high school programming classes using Fortran and Basic languages.

The district, in collaboration with the local cable television company, develops educational programming for the school cable system.

RESOURCES

Development of software designed for specific educational needs has been a major aspect of the district's computer involvement. Much of the available software has been developed locally by teachers and staff, with much of this programming devoted to the validated reading and math programs. The "Computerized Reading Prescription Program" is available for teaching reading. This program is an administrative resource that allows access to a data base containing references to reading objectives and learning materials. The data base references nearly 1000 titles by more than 60 publishers. Also available is a computerized math program for K-6 students. The program is an assessment resource that combines management and recordkeeping at the classroom or resource lab level. Lesson plans, criterion-referenced tests and student learning packets for every objective are included.

SERVICES

Demonstrations can be arranged at the administrative center or in school sites to illustrate specific instructional or administrative applications. Visitors can view demonstrations of software in use throughout the District. They can also tour HOSTS sites and receive documentation of programs currently in operation. Training is available in the development of math and reading programs, based on the two nationally validated programs. Structured training workshops are tailored to the needs of participants. Workshops include opportunities for observation and discussion.

The project is prepared to refer participants to other appropriate resources and to follow up on training activities. A major training emphasis is the development of procedures to involve the private sector. This includes school-business partnerships, funding grants, high technology advice and direction, and joint business/school inservice programs.

CONTACT

Jeanne Mack, Project Director
Vancouver Lighthouse Project
Vancouver School District
605 North Devine Road
Vancouver, WA 98661
(206) 696-7009

SECTION II

FUNDED NDN DEVELOPER DEMONSTRATOR PROJECTS

BASIC LITERACY THROUGH MICROCOMPUTERS

A program teaching students to use an electric typewriter or microcomputer keyboard in the process of learning to type, read and spell. Approved by JDRP for students in grades 1 and 3.

DESCRIPTION Basic Literacy Through Microcomputers is an instructional program that enhances reading achievement, and keyboard skills of students at all grade levels. The Program uses a phonetic approach to reading with the microcomputer (or electric typewriter) being an essential component of the instructional process. The computer does not replace the teacher in instructing, but rather provides opportunities for students to master skills, through reinforced practice.

EVIDENCE OF EFFECTIVENESS Students in grade 1, using the typewriter version of the program, demonstrate reading achievement scores, as measured by the CAT, that are higher than scores in a true control group, at a statistically significant level ($p<.01$).

Students in grade 3, using the microcomputer version of the program, demonstrate reading comprehension and speed-and-accuracy scores, as measured by the Gates-MacGinitie Reading Tests, that are higher than scores of students in a non-equivalent control group, at a statistically significant level ($p<.001$).

IMPLEMENTATION REQUIREMENTS A two-day preparatory inservice education program conducted by a Reid Foundation staff person is desirable. The program includes lecture and practice sessions. It would be advantageous to the trainees to have an Apple II, IIe, or compatible computer(s) available.

FINANCIAL REQUIREMENTS Costs for awareness and training sessions will be based on travel expenses for project staff (to be negotiated). The computer program and materials and a set of four disks sell for $198. Additional backup disks (in sets of four) can be purchased for $60. Teacher texts including Teaching Letter Names and Sounds, Teaching New Words Through Phonics, and Eliciting Responses and Teaching Proofing Skills Through Dictation cost $20 each. Typing and computer tests are included in the program materials.

SERVICES AVAILABLE Awareness materials are available at no cost. Visitors are welcome by appointment at project site and additional sites in other states. Project staff are available to attend out-of-state awareness meetings. Training can be done at project site or at adopter sites.

CONTACT Dr. Ethna R. Reid; 3310 South 2700 East; Salt Lake City, Utah 84109; (801) 486-5083.

CALCULATOR ASSISTED MATHEMATICS FOR EVERYDAY LIVING—CAMEL

An individualized program of instruction in consumer related mathematics using calculators. 9th and 10th grade general math students.

DESCRIPTION The CAMEL project provides a 2-year math program for students in grades 9 and up who are least successful in secondary mathematics and who usually wind up in "general math" classes. These students have gross deficiencies in computational skills and therefore cannot cope with the curriculum content (application) of the 9th and 10th grade. By using the calculator to compensate for the lack of computational skills, students will have time to concentrate on application skills which will enable them to function as informed and responsible consumers.

About 20% of class time is designated as the "computational phase" of the program. This part is completely personalized so that each student will be able to acquire the computational skills in which deficiencies were found.

The program consists of 8 computational modules and 31 application modules. Each module contains a pre and post test.

A Teacher Manual is provided for increasing teacher management skills in diagnosing student needs, in assisting individual students, and in recording and reporting student progress.

EVIDENCE OF EFFECTIVENESS The program was field tested in 1980-81 in 14 junior high general math classes. Results of scores on the Test of Mathematical Skills indicated that the fall-to-spring changes are significantly high compared to 16 general math classes in the control group. All effect sizes were equal to or greater than ⅓ standard deviations.

IMPLEMENTATION REQUIREMENTS The CAMEL program can be implemented by any math teacher. Student-teacher ratio 1:30. A one-day training session is required for implementation. No special facilities are needed. Each student in the program should have access to a calculator. A set of CAMEL materials is required.

FINANCIAL REQUIREMENTS Enough calculators so that each student has access to one and a set of CAMEL materials ($450 for a class of 30 students—$305 for 20 students) which can be used every period of the day.

SERVICES AVAILABLE CAMEL Resource Staff Project consultants provide technical assistance and training in program implementation. Visitors are welcome to visit a demonstration school. Awareness materials are available.

CONTACT Whiteford G. Colee; Project CAMEL; P.O. Box 1910; Daytona Beach, Florida 32019-1910; (904) 255-6475; Sunco.-391-1011.

CALCULATOR MATH

A supplementary program to improve students' mathematical skills through the use of a consumer-oriented curriculum which incorporates the hand calculator. Approved by the JDRP as a supplementary math program for grades 7, 8, and General Math.

DESCRIPTION Calculator Math is a mathematics project which parallels and supplements the 7th-9th grade program. It brings the technology of the hand calculator into the classroom with a proven instructional curriculum. The program teaches students: 1) to use calculators with efficiency and with confidence; 2) to improve their skills in problem solving, rounding off, estimating, and solving consumer word problems; 3) to improve their ability to work with whole numbers, decimals, fractions and percentages. Students use a calculator and calculator math worksheets one-fifth of their math time (approximately one day a week) for a year.

Project materials include the CALCULATOR MATH binder and task cards. Binder contents: Teacher's Guide (describes the implementation and management of the program); Student Guide (introduces the student to the calculator and reviews rounding off, estimating, and solving word problems); Work Sheets (five units which supplement the whole number, decimal, fraction, and percentage curriculum). Worksheet units contain pre-posttests and are adaptable for individual, small group or total class instruction; Answers and Place Value Charts; 180 Task Cards (color coded cards are correlated with specific worksheet activities).

EVIDENCE OF EFFECTIVENESS Calculator Math is cost effective and increases student mathematics performance. Significant gains were achieved on both standardized and criterion referenced tests. An average gain of 14 percentile points for 8 months of instruction was produced.

IMPLEMENTATION REQUIREMENTS The program can be implemented in a typical math classroom using regular teachers. Materials which must be purchased are the Calculator Math Binder and Task Cards (one set per teacher), and liquid crystal display calculators (approximately one per two students). Calculator Math can be adopted by a single classroom or by several classrooms who may share the materials. A one day training session in the management and implementation of the use of calculators in the CALCULATOR MATH Program, and in the development of problem solving skills is required for adoption.

FINANCIAL REQUIREMENTS First year installation costs: Appproximately $5.00 per student including purchase of calculators, materials and training. Subsequent year: $1.50 per student (duplication cost).

SERVICES AVAILABLE Awareness materials are available at no cost. Visitors are welcome at demonstration sites by appointment. Project staff are available to attend out-of-state awareness meetings (cost to be negotiated). Training is conducted at project site or adopter site (costs to be negotiated). Implementation and follow up services are available to the adopter.

CONTACT Carolyn Aho, Director; Calculator Math Office; 400 Mansell Street; Wilson Demonstration Site; SFUSD; San Francisco, CA 94134. Office: (415) 469-5697; School: (415) 239-6200.

CAREERWAYS

A multimedia career education program designed to increase students' knowledge about the world of work and reduce the negative effects of stereotyping on course selection and career choice. Approved by JDRP for all students, grades 7 and 10.

DESCRIPTION Careerways is designed to assist students in identifying and overcoming obstacles based on sex-role and other kinds of stereotyping, and to encourage students to begin career preparations by enrolling in school courses related to their career aspirations. The program consists of 12 thirty-minute television programs, 12 fifteen-minute sound filmstrips, 24 display-sized study prints, and a teacher's guide.

The television programs present examples and effects of stereotyping and emphasize the importance of making career decisions on the basis of interests, abilities, and values. They feature 32 on-the-job interviews with men and women who have been successful in careers considered nontraditional for members of their sex and/or ethnic group. These role models discuss the characteristics of their jobs and the interests, preparation, and abilities that have led to their successes in nine career cluster areas: the Arts, Agriculture, Athletics and Recreation, Business and Office, Health Care, Industry, Science and Engineering, Services, and Transportation. The sound filmstrips parallel the television programs. The teacher's guide contains an outline of each program and offers specific suggestions to motivate students' interest. Follow-up activities include self-assessment of interests, simulations of jobs, and basic skills practice in career contexts.

EVIDENCE OF EFFECTIVENESS Evaluation methods consisted of a pretest vs. posttest control group design conducted at 27 schools from 1978-1983. In the areas of Career Knowledge, Identifying Career Goals, and Career Related Course Selection, the treatment groups significantly outperformed the control groups at the .01 level of significance. Additionally, 88% of male and female treatment students enrolled in elective career-related mathematics courses, and were able to more clearly identify career goals, as compared to 38% of the control group, and 8% of the general district students.

IMPLEMENTATION REQUIREMENTS This program can be implemented as a self-contained career unit at one grade level by one or more teachers following the teacher's guide, or as a school-wide career program tracked into several subject fields. Adopters may choose one of three packages to implement the program: Package 1 includes 12 filmstrips, 24 study prints, and 1 teacher's guide; Package 2 includes 12 video cassettes, 24 study prints, and 1 teacher's guide; Package 3 includes 12 filmstrips, 12 video cassettes, 24 study prints, and 1 teacher's guide. A one-day training workshop is strongly recommended, and requires release time.

FINANCIAL REQUIREMENTS The costs of the three adoption packages are: Package 1, $250; Package 2, $750; and Package 3, $1,000. Teacher's guides ($50) and study prints ($12) may be purchased separately. Costs to reproduce student worksheets will average $.15 per pupil per year. Recommended inservice would require one day release time for participants. Adopters are also asked to pay the trainer's travel expenses and per diem of $200/day.

SERVICES AVAILABLE Awareness materials are available at no cost. Arrangements can be made for visits to demonstration sites. Consultation, training, and follow-up services are available at the expense of the requesting institution.

CONTACT Dr. Ruth Rich, Project Director; Los Angeles Unified School District; Office of Instruction; 450 N. Grand; Los Angeles, CA 90012; (213) 625-6411. Or, Sharon Seib, Project Disseminator; Los Angeles Unified School District; 1320 W. Third, Room 54; Los Angeles, CA 90017; (213) 625-6429.

COMPUTER-ASSISTED-DIAGNOSTIC-PRESCRIPTIVE PROGRAM IN READING AND MATHEMATICS (CADPP)

A computer-managed program in basic reading and mathematics skills, which utilizes a locally developed criterion-referenced testing program to determine skill needs and program evaluation, and generates individual pupil prescriptions. Approved by JDRP as a reading program for grades 3-9 and as a mathematics program for grades 3-7.

DESCRIPTION The CADPP was developed in response to the standardized, norm-referenced test scores of Buckingham County Public Schools' educationally disadvantaged students, which displayed an annually increasing gap between normal expected growth and actual growth.

Operating in a resource laboratory, the CADPP diagnoses the needs of participating pupils with a criterion-referenced testing program; inputs information into a data bank regarding student characteristics in the areas of learning styles and achievement levels; inputs information into a data bank regarding the instructional materials within the local school system; and generates individual pupil prescriptions which attempt to match the student's characteristics to the most appropriate instructional material.

The set of computer programs in the CADPP package is available in two versions: batch COBOL and interactive BASIC. The BASIC language is operative on the APPLE II and TRS 80 microcomputers. The COBOL version has run successfully on IBM and NCR mainframe computers.

The latest extensions of the CADPP have included the addition of the "English As A Second Language" (ESL) application for bilingual or migrant education programs.

EVIDENCE OF EFFECTIVENESS Three-year fall-to-fall testing (1976-78) with the Science Research Associates (SRA) Achievement Series documented positive trends through standard score gains. Grade 3 students showed the highest gains in reading, with 23 NCE's; grades 6 and 7 evidenced 8 NCE's. Gains in mathematics ranged between 22 NCE's for grades 4 and 5, and 6 NCE's for grade 3. Overall, the gap between scores of participating and nonparticipating students was narrowed.

IMPLEMENTATION REQUIREMENTS The CADPP can be adopted by a single classroom unit or by several units within the system. Staff development/training in performance-process evaluation, criterion-referenced testing, classroom management, and computer literacy is offered by the CADPP staff. The CADPP software program must be utilized to operate the system, and the availability of computer hardware within the adopting district is necessary.

FINANCIAL REQUIREMENTS A fee of $500 is charged for the CADPP software; however, any revisions and/or updates to the program are automatically forwarded to adopters at no extra charge. The use of CADPP criterion-referenced tests ($3 per test booklet) is optional to the adopter. Should adopters elect to utilize another testing program, prior permission from the CADPP evaluator must be obtained in advance.

SERVICES AVAILABLE Visitors are welcomed at the project site at any time by appointment. Awareness materials are available at no cost. Expenses for training conducted by project staff, include lodging and $20/day food expenses, along with travel costs to the training site. No consultant fees are charged; however, substitute fees may be charged should training require the use of a certified trainer from another adopting site. Training manuals are $10.00 each. Awareness and follow up monitoring are available; however, such costs will be negotiated.

CONTACT Debra J. Glowinski, Director of Federal Programs; Office of Federal Programs; P.O.Box 292; Dillwyn, VA 23936; (804) 983-2714.

COMPUTER ASSISTED INSTRUCTION

Title I/Chapter 1 Mathematics Laboratory with Computer Assisted Instruction (CAI). A diagnostic/prescriptive pull-out mathematics program with students receiving ten (10) minutes of daily concentrated drill on CAI. Approved by JDRP as a mathematics program for Title I/Chapter 1 students in grades 3-6.

DESCRIPTION The Computer Assisted Instruction Project was implemented to complement the Lafayette Parish's successful Title I/Chapter 1 diagnostic-prescriptive mathematics pull-out program. The program is operated with close coordination of math-lab instruction and daily CAI drill. The CAI program adjusts instructions to the level of the students and provides immediate feedback to the student. The CAI Program provides daily, weekly and monthly descriptions of progress and areas of difficulty which the classroom teacher can use to correct specific conceptual misunderstandings. Classroom instruction is imperative in providing conceptual understanding and remediation. Daily CAI drill provides the practice which Title I/Chapter 1 students especially need. The project operates with forty minutes a day of mathematics laboratory time and ten minutes of CAI. The CAI project was devised by Computer Curriculum Corporation of Palo Alto, California. The addition of CAI instruction produces significantly superior achievement when compared to standard mathematics laboratory instruction.

EVIDENCE OF EFFECTIVENESS A matched group comparison design was used in which both groups received forty (40) minutes of mathematics laboratory instruction and the treatment group received ten (10) minutes of CAI while the comparison group received ten (10) minutes of standard instruction. CTBS standard scores were collected—pre and post—and analysis of covariance was performed on the post standard scores with pre scores as covariables. The treatment group was significantly superior at .01 level. The computer assisted instruction component enabled students to achieve one year's gain in six months. Subsequent follow-ups over two years have shown that gains are maintained and that progress continues.

IMPLEMENTATION REQUIREMENTS Math/Lab-CAI involves the use of a minicomputer. Terminals installed at each site access the minicomputer by telephone. Two to three days of inservice training are necessary. This program is based on the use of materials and equipment from the Computer Curriculum Corporation of Palo Alto, California.

FINANCIAL REQUIREMENTS Cost for the Mathematics Laboratory with CAI is approximately $75.00 per student (based on 1500 students for equipment and program). Two to three days of inservice training is required. The main element is to synchronize diagnostic and programmed methodologies in the classroom together with the computer program and management system of CAI.

SERVICES AVAILABLE Awareness materials are available. Visitors are welcome at project site any time by appointment. Project staff are available to attend out-of-state awareness meetings (costs to be negotiated). Training is conducted at project site (costs to be negotiated). Training is also available at adopter site (costs to be negotiated). Implementation and follow-up services are available to adopters (costs to be negotiated).

CONTACT Marion J. Cortez, Supervisor; Federally Supported Programs; Lafayette Parish School Board; P.O. Drawer 2158; Lafayette, Louisiana 70502; (318) 232-2620 Ext. 307.

COMPUTER ASSISTED INSTRUCTION—MERRIMACK EDUCATION CENTER

A computer instruction program that offers reading, mathematics and language arts to Title I/Chapter I Students. Approved by JDRP for reading instruction in grades 6-9.

DESCRIPTION Operating from an educational service center, this CAI project is an alternative, supplementary approach to providing reading, mathematics and language arts instruction in Title I/Chapter 1 programs. Beginning in 1982-1983, Chapter 2 funds are also allocated for this CAI implementation. Replicability of the drill and practice, as well as tutorial components, is available because the curriculum is standardized and packaged in strands. Instructional objectives of the selected courseware match local objectives and State basic skills objectives. The CAI lessons are planned to supplement the teacher's daily classroom instruction for individual or small group tutorial sessions. The teacher introduces the skill, and then provides review or practice for the learner to maintain and improve that skill. The CAI program is able to branch into further tutorial examples, extend the lesson, or, if the pupil has responded appropriately, progress to a higher level of difficulty in that same skill. Students can easily be followed in reading comprehension and in mathematics skills using diagnostic-prescriptive teaching techniques. The reports produced by the Computer Managed Instruction component enable the teacher to see student gains and measure student progress from week to week.

The CAI program emphasizes basic skills and is effective with low-achieving students who have fallen behind one or two grade levels as compared with their age-mates.

EVIDENCE OF EFFECTIVENESS Use of the reading curriculum over a period of one school year improves student performance in reading. With only 10 minutes per day of CAI reading, students made significant gains in their reading skills over and above those of a comparison group that received the traditional Title I/Chapter 1 instruction in reading. Students were tested each fall and spring with the METRO '78 and curriculum-specific tests on the computer. A three-year longitudinal study found that students in the CAI groups demonstrated significantly superior performance to non-CAI students in reading, and superior performance in mathematics.

IMPLEMENTATION REQUIREMENTS Elementary and secondary schools are equipped with CAI labs using terminals and printers operated by a remote minicomputer. Labs contain 8 terminals that can serve up to 240 students. With the SONY microcomputer, curriculum software is available on diskette. Individual classrooms can utilize the SONY, or a lab set-up of four or more SONY microcomputers is feasible.

FINANCIAL REQUIREMENTS For the 8-terminal classroom lab, costs for leasing are $30,000 per year. Annual service agreement includes technical assistance, maintenance and updated equipment and software as well as all new items that are produced. Costs of operating the CAI system are within the typical per-student Title I/Chapter 1 allocations. One 10-minute session of CAI daily throughout the Title I/Chapter 1 project year was estimated to cost $0.25 per pupil lesson. A lab of four SONY microcomputers and two software curriculum packages for each machine can be purchased through a three year lease/purchase or outright purchase. Under the lease/purchase arrangement, the complete system is approximately $10,000 for each of three years with insurance and extended maintenance warranties included.

SERVICES AVAILABLE An NDN funded Lighthouse Project. Manuals and other supportive materials are available. The computer system is managed, maintained and updated by a central facility and teachers need not learn computer programming. Teachers are trained to operate the system and to prescribe CAI lessons appropriate for individual students from the diagnostic information available on the computer. Technical assistance, teacher training and consultation are available from the service agency.

CONTACT Dr. Richard J. Lavin, Executive Director; Merrimack Education Center; Chelmsford, MA 01824; (617) 256-3985.

COMPUTER LITERACY PROJECT

A course of study designed to give all students a working knowledge of computing. Approved by JDRP for grade 9.

DESCRIPTION The concept of the Computer Literacy Project is based upon the premise that being "Computer Literate" has become a basic skill. Simply stated, this concept is: to give students a basic understanding and minimal working knowledge of most aspects of computers. The concept is essentially the same as that which schools strive for in basic required courses in science or math; that is, a basic working knowledge of the subject. The terms "science literacy" and "math literacy" could be aptly applied. The course is organized in such a way as to meet the goals set forth by the concept of developing a minimal level of competency, or literacy.

Computer History—A knowledge of the concepts, machines, advantages and disadvantages of past and present computers. *The Computing Process*—A knowledge of the different means of inputting information. *Arithmetic Hierarchy*—A knowledge of the correct form of solving arithmetic equations. *Variables and Constant*—A knowledge of how the computer stores data and how it labels the storage locations in which the data is placed. *Flowcharting*—A knowledge of the flow charting required to write a computer program and to use the correct syntax, and how to correct a computer program if it has a mistake. *Computer Vocabulary*—A knowledge of the words and slang words used to describe and discuss computers. *Writing Programs*—The ability to apply all of the information which has been learned.

EVIDENCE OF EFFECTIVENESS As a result of participation in the Computer Literacy course, ninth-grade students demonstrated a significant increase in scores on a project-developed microcomputers literacy instrument that measured their level of knowledge about computers. When compared to non-treatment groups, project students outscored their peers by a mean difference of 9.5 points. The results are consistent for all four semesters examined.

IMPLEMENTATION REQUIREMENTS One computer for approximately every two students who will be enrolled in a given class at a given time. A person to teach the course who is already computer literate. Release time and expenses for a one-half day training session for the teacher.

FINANCIAL REQUIREMENTS If the school does not already own enough hardware to provide one computer for approximately every two students, funds will need to be allocated to purchase whatever brand the school prefers. Approximately two hundred dollars for printed materials. The cost of participating in a training session, to cover the expenses of the trainer, will vary depending on the location and number of persons being trained.

SERVICES AVAILABLE An NDN Lighthouse Project. Awareness materials are available at no cost. Visitors are welcome at the project site any time by appointment. Project staff are available to attend out-of-state awareness meetings (costs to be negotiated).

CONTACT David Woolly, Project Director; Computer Literacy Project; Alma Public Schools; P.O. Box 1018; Alma, AR 72921; (501) 632-4791.

COMPUTER UTILIZATION IN EDUCATION (CUE)

A remedial reading and mathematics program utilizing microcomputers. Approved for educationally disadvantaged students in grades 3-8.

DESCRIPTION CUE is a sequentially organized, criterion referenced reading and mathematics curriculum which incorporates State, syllabus and local curriculum objectives. Criterion referenced objectives are correlated with the skills continuum of commercially developed, computer assisted instructional programs.The CUE curriculum includes assessment techniques which may be utilized for the purpose of student diagnosis, placement, and instructional management.

The program is designed for a laboratory setting rather than as an "in-class" program. Students are scheduled for five, 30-minute sessions per week of remedial instruction. Time on the computer will vary depending upon student remedial area(s) and instructional needs. A student is scheduled to use the computer daily for approximately 15 minutes per session, 75 minutes weekly. Remaining instructional time provides the student with reinforcement activities or with alternate related instructional materials. One computer/microcomputer can service 24 target students based on a six-hour day.

Planning time is provided for the laboratory staff on a daily basis. Teachers, administrators, support staff, and CUE staff utilize the laboratory to access student records (pre and post criterion-test results and computer managed instruction test results) in order to monitor and access student progress. These records can be viewed on a terminal or produced as a printout.

EVIDENCE OF EFFECTIVENESS Evaluation results have shown that 1) Percentage of compensatory students scoring below the 34.4 Normal Curve Equivalent (NCE) will decline from year to year (IOWA subtests); 2) Twenty percent of the students will score at or above the 41.9 NCE and no longer require compensatory education (IOWA subtests).

IMPLEMENTATION REQUIREMENTS Project CUE may be implemented in one school or in a school district. Supervisory personnel, a certified reading teacher and a paraprofessional should participate in training activities. Attendance at a two-day workshop is essential to understand the CUE process, to identify curricula needs for adopters and to participate in microcomputer training. After program implementation, follow-up visits are made by demonstration staff.

FINANCIAL REQUIREMENTS Installation costs vary greatly based upon equipment needs, commercial software purchased, and degree of implementation a district desires. As the number of students in the program increases, the cost decreases proportionately. One set of training manuals, materials, and onsite training is provided by the Project; adopters pay own travel and lodging expenses.

SERVICES AVAILABLE An NDN Lighthouse Project. Visitors are welcome by appointment. Awareness materials are available at no cost. Project staff are available to attend out-of-state awareness meetings (costs to be negotiated). Training is provided at project site (adopter pays its own costs). Training is also conducted at adopter site (costs to be negotiated).

CONTACT Carol Heiselman, Project CUE; Central Square Central School District; Main Street; Central Square, New York 13036; (315) 668-2611.

COMPUTERONICS

A course in programming, problem solving, and computer literacy. Approved by JDRP for gifted and high-achieving students in grades 6 and 7.

DESCRIPTION Computeronics provides students an opportunity to: learn a simple programming language; use computers to solve problems; and see the ways that computers affect their lives. The course consists of two units. "Computers in Society" conveys information about the history of computers, their present and future uses, and computer-related careers. The student text, which employs a magazine format, includes articles, photos, ads, and a glossary. Because of the rapid change in technology this unit is easily augmented through inclusion of current magazine and newspaper materials. "Problem Solving with Computers" teaches students to program using the BASIC computer language. Students use their programming skills in solving word problems. This unit uses a combination of paper and pencil and hands-on activities. This combination allows as many as 10 students to work with a single computer. The materials are not hardware specific and can be easily adapted to a variety of delivery systems.

Both units use a mastery learning approach; each unit objective must be mastered before a student moves on to the next. The management system built into student lesson books, activities, and mastery answer book allows students to move at their own pace. Suggestions for teachers are included in the teacher's guides which include both facilitative and directive classroom organization.

EVIDENCE OF EFFECTIVENESS The nonequivalent control group design was used to evaluate the Computeronics course on fifth through eighth grade high achieving and gifted students. Pre and posttests were administered to the experimental and control groups. The Computeronics *Criterion Referenced Test* (CCRT) with KR-20 reliability of .90 (N-898) was used to assess student knowledge of computers and BASIC programming. The data were analyzed with an analysis of covariance which statistically adjusts for the difference in the experimental and control group pretest means.

IMPLEMENTATION REQUIREMENTS Adopting teachers need teacher materials and two days of training. Students need course materials and access to a computer. The program has been implemented successfully with Apple, Atari, Commodore Pet, Ohio Scientific Instruments, Radio Shack microcomputers and with computer terminals.

FINANCIAL REQUIREMENTS Training costs for the project will depend upon a number of factors such as time and location, and should be negotiated with the project staff. Start up cost for two classes of twenty students each and one teacher, including all student and teacher materials is approximately $400.00. Recurring cost for student consumable materials is approximately $3.65 per pupil.

SERVICES AVAILABLE Visitors are welcome by appointment at the project site and designated demonstration sites. Project staff is limited, but efforts will be made to attend awareness meetings. Training is conducted based upon written request of interested adopters. Training sessions can accommodate 25-30 participants. A major effort is being made to provide certified trainers in a number of locations to expedite cost effective program implementation. Cost for training should be negotiated with the project office, as the NDN funding is limited. Information on materials and training can be obtained by contacting the project office.

CONTACT Director, COMPUTERONICS; Leon County School Board; 925-A Miccosukee Road; Tallahassee, FL 32303; (904) 487-1520.

COOPERATIVE FEDERATION FOR EDUCATIONAL EXPERIENCES (COFFEE)

Approved by the JDRP as an alternative occupational education program in high technology for alienated/disaffected secondary school age students.

DESCRIPTION Project COFFEE was developed in response to the employment demands of high technology and the increasing number of alienated/disaffected secondary school age students. As a comprehensive instructional program, Project COFFEE has uniquely integrated four components: an academic component—which provides relevant (occupational and life coping) basic skills instruction based on an individualized educational plan; an occupational component—which provides hands-on educational experiences in adult-like high technology work environmnt while reinforcing basic skills; a counseling component—which provides occupational and emotional support utilizing state, regional and local social service agencies; and a physical education component—which offers a program of recreational activities adapted to enable students to develop a sense of self-accomplishment and group cooperation. Each occupational program features job entry skills, job placement skills, shadowing experiences and a related work-study program. Occupational programs include Electronic Assembly, Data Processing, Building and Grounds Maintenance, Horticulture/Agriculture and Distributive Education.

Project COFFEE was developed by a regional, cooperative federation of seven school districts and a highly successful partnership with high technology business and industries. The partnership with cooperative business and industry has provided educational assistance in curriculum development, staff training, occupational training materials, equipment acquisition, competency based assessments, internship experiences and more.

EVIDENCE OF EFFECTIVENESS Three year scores (1978-1981) on the Stanford Achievement Test—Advanced Battery documented positive trends through scale score gains not only during the program but when compared to three years scores prior to entry in Project COFFEE. Three year testing with the Tennessee Self-Concept Scales documented significantly higher gains than members of two comparable groups. Students participating in the data processing and electronic assembly programs demonstrated acquisition of entry level skills as measured by a valid and reliable competency based assessment. Students demonstrated a statistically significant decrease in absenteeism when compared within group and to a large group of comparable students.

IMPLEMENTATION REQUIREMENTS Support of educators, parents, community, school board, local social service agencies, and related business/industries is essential. The Project may be adopted by a single school district or by a federation of school districts (cost effective). The program functions extremely well as a "school within a school." Staffing of the program requires the team teaching by a moderate special needs instructor and an occupational instructor for each training program. Implementation of a realistic work environment with state of the art equipment is required.

FINANCIAL REQUIREMENTS Cost of replicating the program is approximately $2,500.00-$3,000.00 per student or $45,000.00-$50,000.00 per training program (15-20 students). Cost and educational effectiveness of the program is greatly enhanced by maximum utilization of existing government supported social service agencies and industry/education initiatives.

SERVICES AVAILABLE An NDN-funded Lighthouse site. Awareness materials are available at no cost. Visitors are welcome at project site by appointment. Project staff can attend out of state awareness meetings (costs to be arranged). Training is available for potential out of state adopter's site or a Developer/Demonstrator site. Follow-up technical assistance is also available. Materials are available at a nominal charge (at cost) and include program manual, basic skills curriculum guide, guidelines for education/industry linkage, guidelines for interagency collaboration/community outreach, procedures manual for development of competency based assessments, diagnostic needs assessment survey manual and manual for student survival skills course.

CONTACT Robert Richardson, Director; Project COFFEE: Oxford Public Schools; 5 Sigourney Street; Oxford, MA 01540; (617) 987-1626.

CUPERTINO CONCEPT: COMPUTER LITERACY PROGRAM

A program teaching computer skills to students in elementary school through junior high school. Approved by JDRP for students in grades K-8.

DESCRIPTION The purpose of the Cupertino Concept is to increase the opportunities for children to become computer literate. The program provides students with a means of understanding computers and their applications in the world around them and helps them to develop skills necessary to communicate with computers and to recognize the capabilities and limitations of computers. The Cupertino Project has developed a computer literacy curriculum for grades K-8 and a management plan for installing computers in schools. The plan provides for sequential staff development activities and includes an inventory of instructional software and software selection procedures.

The instructional program for computer literacy is based on a comprehensive curriculum which focuses on awareness, interaction and programming skills, and objectives for infusing computer activities into the core academic areas. Program models include lab and classroom applications in elementary and junior high schools.

EVIDENCE OF EFFECTIVENESS A pretest/posttest study with 8th graders and a posttest study with 5th and 6th graders were conducted using experimental and comparison groups. Both studies revealed significantly higher scores ($p<.01$) in computer literacy (using modified versions of the Minnesota Computer Literacy Test) among students completing the courses.

IMPLEMENTATION REQUIREMENTS Staff development is necessary to implement the program. Staff development includes a series of fourteen courses covered in a comprehensive five day workshop or an abbreviated three day workshop.

FINANCIAL REQUIREMENTS Costs will vary depending upon the adopters' level of expertise and the hardware already available. Training at the Cupertino site ranges from $100-600 depending on the workshop selected. Additional materials available include a software inventory, a training manual, curriculum and related activity guide.

SERVICES AVAILABLE An NDN Lighthouse Project. Awareness materials are available at no cost. Visitors are welcome on site by appointment. Project staff are available for awareness meetings (cost to be negotiated).

CONTACT Ms. Pamela Skinner; Cupertino Union School District; 10301 Vista Drive; Cupertino, CA 95014; (408) 252-3000.

DEMONSTRATION EVALUATION CENTER (CAM)

A computer-assisted instructional management system for students and teachers. Approved by JDRP as a program for evaluating and monitoring instructional objectives, grades K-12.

DESCRIPTION CAM is a microcomputer based instructional management system using teacher defined course objectives designed to support objective based instruction, competency based instruction or mastery learning approaches.

The Evaluation Center has developed and operates a computer based instructional management system that provides a printout of relevant data to teachers and students after each test taken on course objectives. Also available for inclusion in the printout are data on class performance on each objective and a test form evaluation. The time needed to get this information back to a classroom that has just been CAM tested is generally 24 to 48 hours from the date of testing.

Teachers using the CAM system of monitoring student achievement first commit themselves to basing their instruction on course objectives developed by curriculum groups and teaching teams in the district. They also test the course objectives on a regular basis, every two or three weeks. The objectives are tested by teacher developed test items, generally five to ten for each objective. Most teachers request tests that are pretest, posttest, and retention test in one.

The system is used in classrooms that are group-paced, individualized, multigraded, etc. Approximately 1000 classrooms (1-12) are using the system in subject areas including math, science, social studies, English, and reading. The Evaluation Center has developed techniques to assist teaching teams in identifying instructional strengths and weaknesses.

EVIDENCE OF EFFECTIVENESS Sample evaluation results, using sequential Test of Educational Progress, Language Arts, administered in 1974; grade 10, experimental mean of 52.90, control mean 46.66; grade 11, 58.83, control 46.44; grade 12, 60.93, control 53.75 (all significant at alpha .01). Attitudes of both teachers and students toward CAM-style instruction were significantly positive after use of program. Project findings have been replicated in Yakima, Washington.

IMPLEMENTATION REQUIREMENTS CAM is available for adoption in a single classroom or building. Requirements include: 1) willingness to develop instructional objectives/test items; 2) access to computer facility (micro, mainframe, etc.); and 3) participation in staff development training.

FINANCIAL REQUIREMENTS Microcomputer/printer/optional card reader ($2,000-$2,500); CAM software ($150-$300); local staff workshop time (1-2 days); adopter implementation support; and teacher and aide time ($2,000).

SERVICES AVAILABLE An NDN Lighthouse Project. Awareness material packet (free). Visitors welcome at project site by appointment. Project staff available for awareness meetings, training, implementation, project evaluation consultation, and follow-up services. (Costs to be negotiated.)

CONTACT Marie Weld, Don Sension, Lee Rodel, John Erickson; Administrative Offices; 1001 Highway 7; Hopkins, MN 55343; (612) 933-9230.

INDIVIDUALIZED COMPUTER ASSISTED REMEDIAL EDUCATION (I CARE)

An individualized and computer-assisted program for providing supplemental basic reading instruction. Approved by JDRP as a supplemental remediation reading program for vocational education students (grades 10, 11, and 12).

DESCRIPTION The I CARE Project began in1979 as a federally funded project designed to develop the skills and abilities of vocational students in the areas of reading comprehension and vocabulary. The project incorporates individualized instruction, microcomputers, and audio-visual aids.

Each participant spends a 50-minute class period each day for eighteen weeks completing the following materials: (1) A minimum of 30 computerized vocabulary programs. Each student is required to achieve a score of 80 percent before going on to the next program. (2) A minimum of 30 computerized reading programs. Each student is required to achieve a score of 80 percent before proceeding to the next program. Each time a student scores 100 percent on a reading program, the reading speed of the next program is increased. (3) A minimum of 25 audio-visual reading programs. (4) A minimum of 10 audio tapes with accompanying work-sheets. (5) A minimum of two paperbound books of the student's choice. Each student spends one week in each of the five areas on a rotating basis. This is done to avoid boredom and potential discipline problems that might arise from continually using the same machine for an extended period of time.

A teacher aide is used to set-up student schedules, pretest/posttest students, instruct students in use and care of microcomputers, and maintain student records. The project uses TRS-80 microcomputers (model I, II, and III) and Apple II Plus. Most of the computer programs are locally produced and are written to subject teacher's specification. Main benefits of the program are: teachers determine the content of the computer programs, teachers work with individual students and the opportunity for the student to interact with the computer and set his own learning pace.

EVIDENCE OF EFFECTIVENESS Using a pretest/posttest control group design, (1979-80 and 1980-81), 95 randomly selected grade 10, 11, and 12 vocational education students significantly outperformed (P .001) 95 similar students on Vocabulary and Reading Comprehension subtests of the American School Achievement Tests. Treatment effects accounted for over 25% of the variability in the data and gains were 1.5 and .64 standard deviations for the vocabulary and reading comprehension respectively.

IMPLEMENTATION REQUIREMENTS I CARE can be adopted by a single teacher, a teacher aide, a classroom unit, or by several units. Extensive staff development and training in computer literacy is *not* a requirement.

FINANCIAL REQUIREMENTS Three computer master tape programs have been developed to enable teachers to author student programs in Vocabulary, Spelling, and Speed Reading and Comprehension. Master tapes cost $50.00 per program or all three programs for $125.00.

SERVICES AVAILABLE Awareness materials are available at no cost. Visitors are welcome at project site by appointment. Project staff are available for awarenes conferences and training (costs to be negotiated). Training workshops are also conducted at project site (costs to be negotiated). Implementation and follow-up services are available to adopters (costs to be negotiated).

CONTACT Victor A. Miller, Federal Projects Coordinator; Blue Mountain School District; Red Dale Road; Orwigsburg, PA 17961-0319; (717) 366-0515.

INDIVIDUALIZED PRESCRIPTIVE ARITHMETIC SKILLS SYSTEM (IPASS)

IPASS is a computer managed criterion-referenced testing and instructional program in basic mathematics skills. Approved by JDRP as a supplementary mathematics program for grades 5 and 6.

DESCRIPTION IPASS was designed to increase the achievement of intermediate grade students in mathematics through the use of advanced technology in the form of microcomputers. IPASS employs microcomputers and specially designed software as an integral part of both instruction and the management of student progress in a compensatory education setting. IPASS is an efficient and highly cost-effective project.

IPASS includes locally developed criterion-referenced tests, instructional and management software, cross-referenced tests, cross-referenced instructional resource file, and procedural guides for teachers and students.

IPASS objectives can be used to supplement most mathematics curricula without modification.

EVIDENCE OF EFFECTIVENESS Gains shown by students between pre and posttesting on Metropolitan Achievement Tests in 1980-1981 are substantial and significant—14 NCE's at grade 5 and 15 NCE's at grade 6. At both grades, those gains were about twice the size of national Chapter 1 gains for math projects at the same grade levels using the same testing cycles. The results represent gains from nine different school settings. Gains across sites are similar and have been similar in the past. Previous years' evaluations of the project show sizeable gains for both grades in all project years.

IMPLEMENTATION REQUIREMENTS IPASS is designed as a "pull-out" program in which the student receives two 30 minute sessions per week. Using two microcomputers and a teacher or aide, up to 40 students per week can be served. IPASS can be adapted to an in-class or a labortory setting. IPASS software is available in tape format for TRS-80 Model II/III 16K cassette systems. A disk version is also available for TRS-80 Model I/III disk systems (32K minimum). At least one printer must be available for the test correction, diagnosis and prescription. An intensive training program is required to fully implement IPASS. However, no special computer skills are required. Provision is made within the IPASS program for locally available instructional resources to be merged into the remediation activities.

FINANCIAL RQUIREMENTS A fee of $250.00 is charged for the IPASS software, including computer programs, criterion-referenced tests, student profile sheets, instructional resource file, and procedure guides for teachers and students. One (1) copy of these materials is included and permission is given to reproduce any and all materials and programs in quantities necessary for the adopting school district.

SERVICES AVAILABLE Awareness materials are available at no cost. Visitors are welcome at any time by appointment. Project IPASS staff members are available to explain and demonstrate IPASS at both in-state and out-of-state awareness meetings (cost to be negotiated). Training is conducted at the project site (and is also available at an adopter site) (cost to be negotiated). Implementation and follow-up services are available (costs to be negotiated). Telephone hot-line is available to adopter districts at any time during normal hours.

CONTACT Robert R. Reynolds, Director Project IPASS; Pawtucket School Department; Park Place; Pawtucket, Rhode Island 02860; (401) 728-2120.

INDIVIDUALIZED PRESCRIPTIVE INSTRUCTIONAL MANAGEMENT SYSTEM FOR UNDERACHIEVERS (IPIMS).

A diagnostic-prescriptive program with capacity for computer monitoring for underachievers. Approved by JDRP for grades 7-12.

DESCRIPTION The Individualized Prescriptive Instructional Management System for Underachievers is a diagnostic-prescriptive program with computer monitoring and reporting capacity. The program is operated through a central Reading Center in each participating building which uses color coded, multi-modal and multi-level materials, and a criterion referenced monitoring evaluation schema. An ongoing reporting system provides staff with continuous information about students' progress and a basis for meeting with parents to discuss their children's work. Students receive regular feedback about their own progress as well. The program is delivered by a team of professionals and assistants working with student volunteers.

EVIDENCE OF EFFECTIVENESS As a result of one year of participation in the IPIMS Program, students in grades 7-12 achieved posttest scores in reading, as measured by the Stanford Diagnostic Reading Tests, significantly above those of the publishers' norm group. The significance is beyond conventional statistical ($p < .01$) and educational criteria.

IMPLEMENTATION REQUIREMENTS A two day training session is required to implement IPIMS. Emphasis at these sessions is placed on both the theoretical aspects of the program and providing trainees with "hands on" experience. Among the areas covered by the training are: an in-depth orientation to the total program; an overview of all components selected for the adoption/adaptation by participating districts; a discussion of staff roles, responsibilities and inter-relationships during program installation; the theoretical and applied aspects of the validated program; alternative installation strategies that might be employed by the district to enhance chances for success; a comprehensive review of the evaluation design; and a systematic review of all resources to be employed during the replication.

FINANCIAL REQUIREMENTS Costs involved are $350 for staff training, $2,000 for computer hardware, $2,000 for computer software, $400 for other instructional equipment, $6,000 for materials and consumables (including the cost of upgrading a library of commercial reading materials) and a $500 recurring cost for materials and consumables. Cost per pupil ($n = 100$) $108 for installation and $5 recurring cost.

SERVICES AVAILABLE Awareness materials available at no cost. Visitors are welcome at demonstration site by appointment. Project staff are available for awareness sessions (costs to be negotiated).

CONTACT Sidney Beckwith; Union Springs Central School District; 27 North Cayuga Street; Union Springs, New York 13160; (315) 889-7393.

MAINSTREAM AMPLIFICATION RESOURCE ROOM STUDY (MARRS)

The use of soundfield amplification technology to enhance instruction, lessen teacher voice fatigue and improve student academic achievement in basic skills. Approved by JDRP as an instructional technique to improve basic skills in the regular classroom, grades 4-6, for students exhibiting academic deficits co-existing with mild hearing losses.

DESCRIPTION Project MARRS uses the technology of soundfield amplification of the regular or special education teacher's voice in the presentation of the school's regular curriculum. Amplification equipment is installed in the classroom and the teacher wears a cordless microphone which permits freedom of movement in the classroom. The amplification equipment allows the instructor to maintain a consistent signal approximately 10 decibels above the average ambient noise level in the classroom. Thus, an improved listening environment is created for all students. This amplification enhances the clarity of oral instruction, promotes student attention, lessens teacher voice fatigue and increases academic achievement scores, particularly in students with mild (often unidentified) hearing losses. MARRS provides a cost efficient alternative/supplement to resource room instruction for mainstreamed mildly handicapped students as well as an effective environmental modification to benefit all students and teachers. Regular classroom placement (least restrictive environment) eliminates much of the stigmatizing, labeling, segregation, as well as the expense and scheduling complications of special education and Chapter 1 resource room programming.

EVIDENCE OF EFFECTIVENESS Analysis of data indicated that at all grade levels, target students receiving soundfield amplification of the classroom teacher's voice achieved T-scores on reading and language arts achievement tests (basic skills) closer to the mean of the population after only 1 year of treatment. The target students maintained improved academic scores for as much as 3 years at an additional cost of approximately $50 per classroom per year. This positive change was observed regardless of mainstream grade assignment, subtest observed, or years of treatment. All of the positive changes were significant beyond alpha = .05. Furthermore, at all grade levels after 1, 2 and/or 3 years of treatment, the change was equal to or greater than that obtained (alpha = .05) as the result of resource room instruction, a more expensive intervention.

IMPLEMENTATION REQUIREMENTS Installation of soundfield amplification equipment in classroom. No special staff or curriculum materials are required. Release time for inservice is not required.

FINANCIAL REQUIREMENTS Purchase of soundfield amplification equipment (approximately $1,500 per classroom amplified). Costs for equipment delivery, installation and inservice by project personnel to be negotiated. Maintenance and batteries average less than $50 per classroom per year.

SERVICES AVAILABLE Awareness materials are available at no cost. Visitors are welcome at project sites any time. Project staff are available to attend out-of-state awareness meetings (costs to be negotiated). Training is conducted at project site (costs to be negotiated). Implementation and follow-up services are available to adopters (costs to be negotiated).

CONTACT Helen Ray, Director; Wabash & Ohio Valley Special Education District; Box E; Norris City, IL 62869; (618) 378-2131.

MICRO/MATH

A mathematics program which integrates microcomputer technology with a proven instructional curriculum. Approved by JDRP for students, grades 7-9.

DESCRIPTION MICRO/MATH is a mathematics/technology project which integrates three critical needs of mathematics education into a cost effective supplementary curriculum: (1) the need to teach students how to solve problems; (2) the need to become computer literate; (3) the need to be aware of the use of computers and mathematics in jobs. The curriculum parallels the traditional mathematics classroom program. Students use worksheets with and without microcomputers for 35 to 40 lessons or 1/5 of the math time. The project teaches them:

- to use microcomputers with confidence;
- to write BASIC programs;
- to improve their problem-solving skills of rounding and estimating, processing information from graphs, tables, and charts, and solving word problems;
- to improve their ability to work with decimals, fractions, and percentages.

Computer literacy in project MICRO/MATH is defined as the students' ability to: (a) understand how a computer works; (b) develop programs in BASIC language; (c) use computer skills in problem solving and (d) read and interpret computer output.

The MICRO/MATH project can be readily adapted to a broad spectrum of established classroom organization structures and draws upon many modes of instruction. The project does not require restructuring of the school curriculum nor additional personnel.

EVIDENCE OF EFFECTIVENESS An independent evaluation showed that students who spent one fifth of their math time in the project experienced significantly more growth in mathematical problem solving and computer literacy than did their counterparts. Achievement was measured by the Comprehensive Test of Basic Skills (CTBS) and the MICRO/MATH Criterion-Referenced Test (CRT).

IMPLEMENTATION REQUIREMENTS Required staff training includes an introduction to BASIC (10 hours) and project usage and management (four hours). Purchase of materials and availability of microcomputers are necessary. MICRO/MATH can be implemented in a typical math classroom using regular classroom teachers. It can be adopted by a single classroom or by several classrooms which share computers.

FINANCIAL REQUIREMENTS Initial materials cost of $80 (per classroom) covers training packet that includes a binder with over 100 worksheets, and transparency masters, problemsolving activities, management plan, testing instruments and student workbooks (15 copies). Training is conducted at project site or adopter site (costs to be negotiated).

SERVICES AVAILABLE Awareness materials are available. Visitors are welcome at demonstration sites by appointment. Project staff are available to attend out-of-state awareness meetings (costs to be negotiated). Implementation and follow-up activities are available to the adopter.

CONTACT Director, MICRO/MATH; Education and Technology Foundation; Center for Educational Development; 1855 Folsom Street, Room 544; San Francisco, CA 94103; (415) 626-3070.

MIGRANT STUDENT RECORD TRANSFER SYSTEM (MSRTS)

A Computer Link Offering Variable Educational Records (CLOVER). Approved by JDRP as a program for migrant children, preschool through secondary, and teachers, teachers' aides, nurses, counselors and administrators.

DESCRIPTION The Migrant Student Record Transfer System (MSRTS) is a computerized system with 162 terminals located in 44 states. The system serves 49 states, Puerto Rico, and the District of Columbia. Through MSRTS, the process of receiving, storing and transmitting health and educational information is available to all school, education and/or health organizations which serve migrant children. Teachers, nurses, aides, administrators, and others have at their disposal educational and critical health data delivered to their state within 24 hours of a child's enrollment. In four days or less, an in-depth record of educational and health data will be received at the state's designated location. This information may direct the adopter in formulating strategies to assist the migrant child in achieving academically. Curricula being taught to migrant children are established by each state through an application submitted to the U.S. Department of Education and vary according to the established needs of migrant children. The system's computer is programmed to provide skills-based information in the areas of Reading, Math, Early Childhood, and Oral Language.

EVIDENCE OF EFFECTIVENESS Effectiveness and utilization of the information received by the user is controlled and evaluated by each state. A statistical survey in 1983 showed 108 schools participating in the system; 1,814,201 academic records were sent; 1,224,830 medical records were sent; and 1,268,813 skills records were sent. These figures have increased each year since 1976. A 1983 study of turnaround time showed: 26.4% of the records were received by the user in 2 days, 42.5% in 3 days, 9.4% in 4 days, and 21.7% did not respond. A total of 78.3% of the records were received in 4 days or less.

IMPLEMENTATION REQUIREMENTS Interested adopters who have migrant children in their school plant, or other education and health organizations who serve migrant children may contact the state director of migrant education, or can write or call the contact persons listed below. Implementation requirements will be based on the level of participation.

FINANCIAL REQUIREMENTS Training and materials are available to Education/Health Organizations serving migrant children at no cost. Other agencies outside the U.S. Department of Education that serve migrants may receive MSRTS services at a negotiated cost; these costs can be as low as the cost of the Education/Health Training Manual ($2.50) and the Skills Manual ($10.50). Travel, lodging and per diem costs are negotiable.

SERVICES AVAILABLE Awareness materials are available. Visitors are welcome at project sites by appointment, Monday through Friday, 8:00 a.m. through 4:30 p.m. Training is conducted at the project site (adopter paying its own costs). Quarterly workshops are held during February, May, August and November in Little Rock.

CONTACT Mr. Winford "Joe" Miller, Director; or Mrs. Janis K. Lunon, NDN Regional Supervisor; Migrant Student Record Transfer System; Arch Ford Education Building; Capitol Mall; Little Rock, Arkansas 72201; (501) 371-1857.

PROJECT QUILL: MICROCOMPUTER-BASED WRITING ACTIVITIES

Approved by JDRP for all students in grades 3-5.

DESCRIPTION QUILL is a microcomputer-based writing program that provides students with software tools for planning, composing, revising, storing, retrieving, and printing written text. QUILL also provides teachers with training and assistance to integrate the software into classroom writing instruction and writing in content areas. The primary purpose of QUILL is to provide students with motivating writing activities in a structured, computer-based format, which allows for flexibility in addressing student ability and interest. Additionally, QUILL offers students use of "real life" microcomputer tools, including text editor and message system software. Finally, QUILL provides teachers with tools to supplement and expand language arts and writing instruction, especially in the areas of expository and persuasive writing.

EVIDENCE OF EFFECTIVENESS Intermediate level elementary students (grades 3-5) significantly improved ($p<.05$) the quality of their expository writing, as measured by pre and post writing samples in comparison with a matched control group. Intermediate level elementary students significantly improved ($p.<.05$) the quality of their persuasive writing, as measured by pre and post writing samples in comparison with a matched control group.

IMPLEMENTATION REQUIREMENTS At least one computer system per class (Apple with 64k, two drives, 80 column display, green screen monitor, and printer). A computer lab setting is acceptable. The program requires a Facilitator—someone from the existing staff—who is oriented to the roles necessary to implement the program and who can act as a local resource person.

FINANCIAL REQUIREMENTS Staff training and implementation assistance and purchase of software and hardware are the primary costs. The cost of training (3 days) and on-site assistance (2 days) will vary depending on availability of Federal, state and/or multidistrict funding (2 or more districts participating in training). The software package from a commercial publisher costs $150 per teacher. Additional materials (e.g., disks, paper) cost approximately $125 per teacher. Hardware costs will vary depending upon equipment already available to the adopter.

SERVICES AVAILABLE Visitors are welcome at demonstration sites located throughout the country. Awareness materials are available at no cost. Project staff are available for presentation and training (cost to be negotiated).

CONTACT Denise Blumenthal or David Zacchei; The NETWORK, Inc.; 290 South Main Street; Andover, Massachusetts 01810; (617) 470-1080.

RAM-READING AND MICRO MANAGEMENT

A program of developmental/corrective reading instruction in a laboratory setting. Approved by JDRP for students in grades 7 and 8.

DESCRIPTION The goal of the RAM-Reading and Micro Management Project is to provide the necessary instruction and materials to develop the reading skills of students who have skill deficiencies, and to provide enrichment where needed. This success-oriented program is conducted in a lab setting with an informal atmosphere, yet it is highly structured. Students are divided into groups that rotate into the lab from a subject class on alternate weeks. The lab is comprised of ten learning centers that offer a wide selection of activities using various learning modalities. The work is graduated according to students' reading abilities, which range from non-reader to post high school level.

Computers are used to assist instruction in reading comprehension, vocabulary, writing, structural analysis, and other language arts skills. A diagnostic/prescriptive management system is used to select specific skill deficiencies for groups of students. Public domain and commercial software programs are assigned that correspond with these skills deficiencies.

A diagnostic/prescriptive approach to teaching assures each student of individualized instruction. The focus and skills to be mastered are determined for each student at the beginning of the seventh grade using the PRI as a measurement tool of reading abilities. Students with similar deficiencies are grouped together; students move to other skill areas as specific skills are mastered.

In the regularly scheduled reading and English classes, these same crucial skills are emphasized with whole class activities for 20 minutes each day for a three-week period. The lab activities reinforce and supplement this instruction.

EVIDENCE OF EFFECTIVENESS Measured against the national norming sample of the Comprehensive Test of Basic Skills, project students gained 28 to 45 points more than their expected posttest mean. On the average, students gained 2.7 months for each month of instruction.

IMPLEMENTATION REQUIREMENTS For successful implementation of the program, staff must be committed to a child-centered, diagnostic/prescriptive approach to teaching, and be willing to utilize learning centers and small group instructional techniques. The total program is suited for adoption by a whole school or district. Individual components of the program can be adapted for use in any class or lab. Depending on available resources, the lab can be staffed by a teacher with an aide, or by an aide alone. A five-day staff development inservice is recommended for adopting schools.

FINANCIAL REQUIREMENTS Costs will depend on the needs and resources of the school. The program uses a wide variety of commercially available materials already found in most classrooms. If no equipment needs to be purchased, the start-up cost per pupil (n=500 students) is $11. If computer equipment must be purchased, the cost per pupil is $21. This initial cost includes the services of a trainer for one week. Maintenance costs are about $8 per pupil in subsequent years.

SERVICES AVAILABLE Awareness materials are available at no cost. Visitors are welcome at the project site by appointment. Project staff is available to attend out-of-state awareness meetings and training sessions (costs to be negotiated). Training is also available at the project site.

CONTACT Barbara Clark; Demonstration Reading Program; Sierra Junior High School; 3017 Center Street; Bakersfield, CA 93306; (805) 323-4838.

READING EDUCATION ACCOUNTABILITY DESIGN: SECONDARY (READ:S)

A comprehensive, microcomputer-assisted, reading-in-the-content-areas program. Approved by the JDRP for students, grades 7-12.

DESCRIPTION Through the use of teacher-developed instructional modules and/or computer-assisted lesson designs, this program emphasizes student mastery of a hierarchy of 60, adult-level reading skills. Project READ:S teachers instruct/reinforce essential reading skills on a daily basis by delivering the content of their subject matter courses in the formats of Project READ:S lesson-design modules. The program integrates five components: instructional, which emphasizes direct skills instruction by language arts/English teachers; reinforcement, which provides for mastery of the priority reading skills in all content-areas; in-service, which focuses on both the content and processes of instructional delivery; management for record-keeping; and a computer-assisted component for schools utilizing computer technology in management and instruction.

Teachers receive a minimum of three days of in-service training in the construction, application, and evaluation of teaching/learning modules. Using the results of a criterion-referenced test, the Wichita Reading Inventory, teachers are able to determine individual reading skill proficiencies and/or deficiencies. The language arts teacher then structures his/her curriculum for instruction, and students progress as far and as fast as they are able to master the ascendency of adopted skills. In addition, content-area teachers use the test's scope and sequence to construct teaching/learning modules in vocabulary, comprehension, and study skills. Students are required to successfully complete a minimum of one vocabulary, one comprehension, and one study skills module in each unit of instruction. It is the cumulative effect of using reading skills in each academic discipline that is the thrust of this program.

EVIDENCE OF EFFECTIVENESS JDRP approval and NDN validation of Project READ:S based on a four-year study. Selection by U.S. Department of Education's Technology Branch in 1983 as one of 12 national technology demonstration sites.

IMPLEMENTATION REQUIREMENTS A three day preadoption in-service workshop is necessary. Project aides are helpful but not essential for replication of this project.

FINANCIAL REQUIREMENTS Cost for replicating Project READ:S will vary according to the location of the adopting site, the number of personnel to be trained, and the number of students to be served. Four days of trainer's time, $600 plus travel and per diem. Training packet, $55. Optional management system diskettes are $500 per set.

SERVICES AVAILABLE Awareness materials are available at no cost. Visitors are welcome at the project site. Project staff are available to attend out-of-state awareness meetings (costs to be negotiated). Training is provided at project site (adopter pays own costs). Training is conducted out of state (project staff costs must be paid). Project staff can attend out-of-state conferences (expenses must be paid).

CONTACT Lynn Dennis, Project Director; Coeur d'Alene School District No. 271; 311 N. 10th Street; Coeur d'Alene, Idaho 83814; (208) 664-8241.

RESEARCH EXCHANGE FOR COMPUTERIZED INDIVIDUALIZED PROGRAMS OF EDUCATION (RECIPE)

An instructional management system to increase individualized Education Program (I.E.P) objectives attainment using a microcomputer-based recordkeeping system. JDRP approved for Elementary (K-6) Learning Disabled Students.

DESCRIPTION The RECIPE instructional management system provides banks of instructional objectives in the basic skills areas of reading, writing, and mathematics, organized into learning maps which provide the special education teacher with an organizational pattern for planning instruction. Banks of objectives are also provided for the areas of Foundation (pre-reading), Articulation, Socialization, and Motor Skills. The objectives are accompanied by two forms of a criterion-referenced assessment system and a listing of over 2400 instructional strategies correlated to each objective by number. Student Activity Books and Audio Tapes are available for 25 of the basic skill learning maps with which the target population displayed the most difficulty. Teacher Guides and Answer Books are provided with the Student Activity Books. Additional planning materials, Parent Guides, and a student reward system are built into the RECIPE material package and delivery system process.

Microcomputers are employed as the vehicle for storing student demographic data, creating I.E.P.'s and implementation plans, tracking student progress, and generating I.E.P.'s and Progress Reports in compliance with Federal Guidelines. Student and program data are stored on floppy diskettes and RECIPE provides a detailed User's Guide for ease of computer interaction.

EVIDENCE OF EFFECTIVENESS Objective attainment data (medians) indicate that computerized RECIPE students mastered more than 2 times as many basic skill objectives as the control students; noncomputerized RECIPE students mastered 1.6 times as many objectives.

IMPLEMENTATION REQUIREMENTS The RECIPE instructional management system may be implemented in a variety of educational settings ranging from a single classroom setting with one teacher and up to 30 students to the district level with multiple teachers and classrooms. Data is managed by microcomputers in all settings. Training in the use of RECIPE instructional materials, processes, and microcomputer program uses is required. No additional staff are required for program implementation.

FINANCIAL REQUIREMENTS Replication costs will vary based on the number of teachers and students. For one classroom (one teacher serving 30 students), approximate cost for program installation and training is $61.69 per student per year. Based on usage in at least two classrooms with 60 students, installation cost per student drops to $31.00 per student per year. Microcomputer hardware costs are not figured into replication costs. Continuation costs for RECIPE are estimated to be $18.50 per year, per student.

SERVICES AVAILABLE Limited amounts of awareness materials are available at no cost. As a Lighthouse Project, RECIPE welcomes visitors to the project site anytime by appointment for demonstrations and observations. Project staff are available to attend out-of-state awareness meetings on a limited basis, and training is available at both the project site and adopter sites (price to be negotiated). Implementation and follow-up services are available to adopters (price to be negotiated).

CONTACT Sanders Bell, Director; or Priscilla Cady, Training Specialist; Project RECIPE; 4747 S. Tamiami Trail; Sarasota, Florida 33581; (813) 953-5000, ext. 141 or (813) 924-5800.

UTILIZING COMPUTER-ASSISTED INSTRUCTION IN TEACHING SECONDARY MATHEMATICS

An integrated curriculum using computer activities and traditional instructional strategies. Approved by JDRP as a mathematics program for grades 9-12.

DESCRIPTION Utilizing Computer-Assisted Instruction in Teaching Secondary Math was developed by the Asbury Park High School in response to a need to improve student achievement in mathematics and to integrate the use of computers into the mathematics curriculum. Computer-assisted instruction combined with traditional instructional techniques are utilized in teaching Algebra I, Algebra II, Geometry, Trigonometry, Calculus, and Applied Mathematics. The project materials consist of forty-four (44) teaching units for the six identified courses with computer programs as the core of each unit.

In addition to the teaching units and computer programs, a battery of standardized tests are required for student evaluation.

EVIDENCE OF EFFECTIVENESS The program has demonstrated that changes are significant and desirable, as project students on almost all measures of student achievement both in the preliminary and final field test using standarized and locally developed tests, achieved at a higher level after utilizing the program materials.

IMPLEMENTATION REQUIREMENTS A minimum of seven micro-processors or timesharing terminals are required to support project software for a medium size high school population. In addition, staff training in the use of computer programs, teaching units, and project tests is required.

FINANCIAL REQUIREMENTS A fee of $150 is charged for the teacher manuals and computer programs. Training costs are negotiable based on the number of participants and length of sessions. Standardized tests must be purchased by the adopter school.

SERVICES AVAILABLE An NDN Lighthouse Project. Awareness materials are available at no cost. Visitors are welcome at project site any time by appointment. Project staff are available to attend out-of-state awareness meetings (costs to be negotiated). Training is also available at adopter site (costs to be negotiated). Implementation and follow-up services are available to adopters (costs to be negotiated).

CONTACT Ms. Judy Smith, District Supervisor of Instruction; Asbury Park Board of Education; 1506 Park Avenue; Asbury Park, NJ 07712; (201) 776-2619.

SECTION III

UNFUNDED VALIDATED PROJECTS

CASHFLOW FORECASTING SYSTEM

A computerized method of forecasting cashflow for use in making investment and loan decisions. Approved by JDRP for school administrators and accountants who make investment or loan decisions.

DESCRIPTION This system was installed to assist in the making of investment and loan decisions and, specifically, to produce at least an eight percent increase in general fund interest earnings for the Jefferson County School District. The system provides the ability to enter forecasted and actual data for four different funds and then to project the cash balance for each day of a fiscal year. The data are revised to reflect actual transactions, and the projected cashflow balance is automatically recalculated for each day remaining in the fiscal year.

Since it was put into operation in April 1979, the system has proved to be far more effective than the informal, manual system it replaced. Financial management can now be based on the most complete and up-to-date information possible, with the data available almost instantly.

A computer terminal and a computer system that supports terminal operations and provides disk availability are used. The programming language is BASIC because this is the language normally used to teach computer programming to students. The Jefferson County School District already had a BASIC instructional program, so the necessary hardware and software were available for the Cashflow Forecasting System at no additional cost. The system provides the ability to process four separate funds. The types of financial data processed include loans and investments, payroll deductions, bond payments, and four optional revenue and three optional expense categories.

EVIDENCE OF EFFECTIVENESS The computerized Cashflow Forecasting System was compared to the manual system it replaced. After the first full year of implementation, use of the computerized system had resulted in a 42% increase in interest earnings. This increase represented approximately a half million dollar increase in interest income.

IMPLEMENTATION REQUIREMENTS A good working knowledge of cashflow techniques and access to data processing equipment are necessary to implement the system. The system is written in BASIC for Honeywell computer hardware. Conversions to other major hardware systems are possible.

FINANCIAL REQUIREMENTS A complete listing of the system programs and complete documentation are provided free by the project. Access to data processing equipment is necessary. Adopters may need programming support if conversions to other hardware systems are necessary.

SERVICES AVAILABLE Since the project is not currently funded services are limited. Visits to the project site can be arranged. Orientation and training can be arranged (costs to be negotiated). Contact the project about other services.

CONTACT Charles W. Grissett, Treasurer; Jefferson County Board of Education; 3332 Newburg Road; Louisville, KY 40218; (502) 456-3351.

COMMUNICATION ARTS AND SCIENCES TECHNOLOGY (CAST)

A two year program combining English instruction with television production techniques. Approved by JDRP for students in grades 9-12.

DESCRIPTION The Communication Sciences, or technological component of the CAST curriculum, provides students with extensive television experience. Skills development areas include utilization and operation of the television camera and the production switcher as well as audio components, video tape recording, lighting, editing of both audio and video, set design and construction, and other related television production operations. The Communications Arts portion is devoted to formal English instruction designed to enhance and reinforce Language Arts skills as used in the communications field. Areas of specialization include script writing techniques for producing news, documentary programs, interview programming and advertising and marketing. In addition, various works of poetry, short stories, novels and plays are read, interpreted and evaluated as concerns their potential integration into television productions. The second year of CAST provides for additional content awareness and skills development in advertising, program ratings, multi media productions, communications history, FCC license preparation, and film use in television. CAST students also participate in various school projects associated with telecommunications including Cable Television.

Indicative of its interdisciplinary characteristics, the CAST program encourages students and teachers to work closely with students and teachers in the Music, Art, Vocational, Business Education, Foreign Language, Social Studies and English departments in the mutual development of educationally oriented telecommunications projects.

EVIDENCE OF EFFECTIVENESS As a result of involvement in CAST, students developed extensive technical skills in television and communications; 78% were accepted into two or four year post secondary schools where they will major in communications. CAST students showed a significantly better record than the general high school population in terms of fewer suspensions, fewer dropouts, increased attendance and improved grade point average in academic studies.

IMPLEMENTATION REQUIREMENTS Staff training in: CAST Language Arts and Sciences Curriculum geared for telecommunications; the technical skills and studio operations associated with television production and associated telecommunications projects. Selection of: CAST students with the assistance of the guidance department and CAST staff, based on student interest and motivation in the program; CAST teachers to implement the program. Utilization of T.V. studio/laboratory and operation of instructional equipment recommended for the program. Selection of student activities and projects according to individual interests, needs and program objectives. Use of prescribed print and non print curriculum materials designed for the CAST program.

FINANCIAL REQUIREMENTS The starting packet of instructional print materials can be purchased for $150 with permission given to the adopting district to duplicate consumables. Instructional media units can be purchased for $37 to $72 per sound/slide set and $47 per video tape. An adopting District may develop additional media units following the CAST format if they wish. A "loan" arrangement covering all media materials can also be established with adopting districts at no charge, with the exception of postage, handling and insurance.

SERVICES AVAILABLE Orientation sessions for Board of Education members, school administration, instructional staff, students and parents. Facilities and instructional equipment assessment, equipment compatability planning and design. Continuous follow up in program implementation. Assistance in writing adoption grants for districts interested in adopting the CAST project.

CONTACT Robert M. Petracco, Director; Union Township Board of Education; 2369 Morris Avenue; Union, New Jersey 07083; (201) 688-1200.

COMPUTERIZED PUPIL ATTENDANCE/CENSUS SYSTEM

A computerized system for tabulating and processing state-mandated pupil attendance and census figures and reports. Approved by JDRP for local education agencies and consortium of local education agencies.

DESCRIPTION This system was set up with the objective of reducing by 40 percent the time required to compile and maintain pupil accounting and census information and to prepare the monthly and annual reports that are state mandated in Kentucky and are the basis for determining each school district's funding. By shifting from a system maintained by hand to a computerized system, the 38 school districts that are members of the Eastern Kentucky Educational Development Corporation have found it possible to make more efficient use of district personnel. The system is set up to allow for yearly initial input of student information, ten monthly cycles of collecting and reporting attendance data, annual reporting of attendance and other statistical data, and periodic and annual reports of census data for state and local use. The system is designed to produce these reports: teacher's record of daily attendance, teacher's monthly attendance report, principal's monthly attendance report, principal's annual attendance report, superintendent's annual statistical report, attendance growth factor report for first two months, annual census report, district census report, and other management reports needed by school district administrators.

EVIDENCE OF EFFECTIVENESS The system was compared to a manual system for calculating attendance figures through a survey instrument. The average amount of time saved was 40%. This time savings for teachers and administrators allowed them additional free time to be more productive in areas involving their expertise as opposed to the tedious clerical task of preparing monthly and annual reports by hand.

IMPLEMENTATION REQUIREMENTS The programming language in which the programs are written is COBOL 74. The equipment currently being utilized is Sperry Univac System 80. Extensive training in the proper administration and operation of the system is required. Purchase of specialized forms is also required. Chapter II funds are currently being used by participating school districts to fund the project.

FINANCIAL REQUIREMENTS Actual costs for adoption and maintenance of the project will vary according to size, availability of computer services and other such factors. Costs for operating this system in thirty-five (35) school districts with approximately 150,000 students is $264,879.00 or $1.79 per student. An adopting district or group of districts not having data processing equipment will experience certain start-up costs such as purchase of computer equipment, Data Center Staff Development and the costs of providing necessary facilities to house the data processing equipment and staff.

SERVICES AVAILABLE Awareness materials are available at no cost. Visitors are welcome at project site any time by appointment. Project staff are available by phone and are able to travel to adopter's site. Training can be conducted at either the developer's site or the adopter's site. Implementation and follow-up services are available (cost to be negotiated).

CONTACT Harry P. Brown; Eastern Kentucky Educational Development Corporation; P.O.Box 1269; 925 Winchester Ave.; Ashland, KY 41101; (606) 324-5161.

M2C: MATH MOTIVATIONAL CENTERS

A pull-out program that provides intensive remedial instruction. Approved by JDRP for students in grade 9.

DESCRIPTION In each Math Center, which is set up to operate separately from the math classrooms, are located state-of-the-art materials for instruction in basic math skills. The M2C instructional management system provides for diagnosis, through criterion-referenced pretests of each student's strengths and weaknesses in specific skills. Mastery of each instructional unit is measured by criterion-referenced posttests. A simplified record keeping system is used to document each student's progress through his or her own curriculum path. The component skills of mathematics have been tagged with 239 separate learning tasks and a series of matched math action applications. Each student has a folder in which all of the numbered tasks and applications appropriate to the level of study are listed with check-off boxes. As the student completes a unit, and passes the test that goes with it, the progress can be recorded on the folder to allow the student to identify the exact skills mastered and the progress being registered.

Each Math Center is under the direction of an instructor who works with the students and reports their progress to the regular math teacher. Skill diagnosis and determination of individual needs are first determined by the regular math class teacher. Computer-assisted instruction is also a part of the center. The terminals are not only important in providing motivation for the student, they also provide the opportunity to become literate in the use of computers. Parents are involved as both tutors and learners at the Math Centers.

EVIDENCE OF EFFECTIVENESS After one school year, ninth grade students who received instruction through the Math Centers demonstrated significant gains on the Stanford Test of Academic Skills in Mathematics, relative to a comparison group of similar students. The project students climbed 16 percentile ranks to the 32nd percentile, the comparison group climbed only 8 ranks, from the 16th to the 24th on the national norms.

IMPLEMENTATION REQUIREMENTS A Center can be established per teacher's manual directions; however, site visitations and formal workshop are recommended.

FINANCIAL REQUIREMENTS Estimated cost to implement a Center other than computer hardware is $500 per Center which includes teacher's manual, computer software, and training. (This does not include travel to training site).

SERVICES AVAILABLE Visitors are welcome at project site by appointment. Training is given at workshops. Time and place for workshops will be sent upon request. Brochures are also available upon request.

CONTACT Carolyn Rosenfield, Assistant Superintendent for Curriculum and Instruction; Board of Education; 105 Main Street; Norwalk, CT 06852; (203) 847-0481.

MEDIA NOW

A production-centered laboratory course of study in mass media technology and production techniques that helps students understand and cope with the influences of the mass media. Approved by JDRP as a media study program for students in grades 7-12.

DESCRIPTION Media Now was developed by the Southwest Iowa Learning Resource Center to help students cope with the influences of communication technology. Students on the high school level, through a sytematic, hands-on exploration of mass media techniques and influences, develop critical viewing and listening skills to help them cope with the persuasive power of the mass media.

This course contains 623 reading, writing and production tasks, organized at four levels, which motivate students to evaluate, interpret, analyze and better appreciate media technology. The program can be conducted in the traditional classroom time periods and is often offered by the language arts department, although other discipline areas can also incorporate selected components. The program design includes performance objectives and "learning by doing "as a part of the management system. The course organization includes fifty "learning packages" grouped under seven modules which include Production, Hardware, Aesthetics, Genre, Evaluation, Message Interpretation and Presentation. Modules and packages may be used in an existing program or as a separate course offering. The program can be taught with existing staff. Various hardware items normally available in most schools will be needed depending upon selected objectives.

EVIDENCE OF EFFECTIVENESS Research (1972-74) employed project developed instruments in a pre/posttest control group design; testing included 25 Iowa High Schools encompassing inner-city, suburban, large rural, and small rural districts. Field testing and evaluation have included 140 Iowa School Districts. Significant gains (as compared with control students) were scored by Media Now students. Continued evaluation results (1980-81) show that Media Now provides students with the knowledge and skills required for informed media consumption and skilled media production. Research also indicates that an individualized approach to learning is an effective method for presenting course material in the study of mass media.

IMPLEMENTATION REQUIREMENTS Adopters of Media Now must purchase one Media Now Course of Study, which includes 50 learning packages, teachers' guide and appropriate manuals. The program can be adopted by an individual teacher, or may be used in a team approach. At least two staff members from adopting schools must be trained in a two-day workshop. Media Now can be used in a normal classroom setting where minor furniture movement is possible. Darkroom facilities are helpful but not mandatory. Basic media production equipment is needed depending upon selected goals and objectives.

FINANCIAL REQUIREMENTS Media Now full course of study, $960.00; Student Learning Activity Guide (SLAG), $9.00 (one per student recommended); Student Learning Activity Book (SLAB), $9.00 (one for every two students recommended); Teacher Activity Book (TAB), $12.00. All modules and packages are available on an individual basis; training fees (cost to be negotiated).

SERVICES AVAILABLE Awareness materials available at no cost. Visitors welcome by appointment. Staff available for out-of-state awareness meeting (cost to be negotiated). Training is conducted at adopter sites or at demonstration site (cost to be negotiated). Implementation and follow-up services available to adopter (cost to be negotiated). Toll free telephone consultation.

CONTACT Ron Curtis, Director Media Now; *experience education;* 401 Reed Street; Red Oak, Iowa 51566; 1-800-831-5886 or 712-623-4913.

MICROCOMPUTER-BASED ADMINISTRATIVE PROGRAMS: PROJECT SIMU-SCHOOL

A program using microcomputers to provide financial and bibliographic services. Approved by JDRP for school administrators, regional educational agency directors, colleges of education, and educational computing consortia.

DESCRIPTION The project consists of two programs: (1) Financial Projection Program—includes tax, revenue, and expenditure history and projection data in an "electronic spreadsheet" format; accommodates multiple funds and objects; and may be used to develop a two-year budget. Ten built-in projection methods with key parameters and economic indicators may be used to "drive" the forecasts, with projection method selectable by single keystroke. The program allows data to be stored and retrieved. Installation of a local chart of accounts is included. The same formulas used in the mainframe and microcomputer versions of the Financial Projection Program are listed and explained in *A Guide to Budget Projection Formulas*. These formulas are ready to incorporate into special-purpose computer programs or templates for popular spreadsheet programs. (2) Automated Library System—A full-function automated library system with check-in/check-out, fines accounting, due and past-due notice printing, current borrower identification, circulation analysis, and reference searching capabilities. Electronic catalog contains accession number, title, author, call number, category, publisher, copyright year, and up to seven subject areas. For libraries with 5,000 to 50,000 volumes.

EVIDENCE OF EFFECTIVENESS The programs provide a quantitative basis for certain administrative planning and decisionmaking functions; tools to assist in the projection of available resources; and a database for efficient recordkeeping and research functions. The programs take the place of error-prone manual methods. They provide the added advantages of organizing and managing data, applying uniform and tested formulas to derive relationships in the data, and providing a variety of reports for classroom, campus, and district level use.

IMPLEMENTATION REQUIREMENTS All programs require an IBM PC, a Radio Shack Model III or Model IV, or equivalent microcomputer. The library system is intended for computer with hard disk (usually 5 to 20 megabyte capacity). Formulas in the *Guide* can be used on any computer.

FINANCIAL REQUIREMENTS Financial Projection Program: $2,000. *A Guide to Budget Projection Formulas:* $35. Automated Library System: $3,000.

SERVICES AVAILABLE Awareness materials are available at no cost. Visitors are welcome at project site by appointment. Project staff are available to attend out-of-state awareness meetings (costs to be negotiated). Training is provided by tape and manual or by trainers at project site for Financial Projection Program (adopter to pay only its own costs). Training is conducted at adopter sites for Automated Library System with adopter paying only travel expenses.

CONTACT M. William Dunklau, Director; Project Simu-School; 8160 San Cristobal; Dallas, TX 75128; Answering Service ("Microparametrics") (214) 327-6914.

MOUNTVERNON TV READING AND COMMUNICATION

A program harnessing the power of popular television videotapes and scripts and the feedback of a video camera to improve reading skills. Approved by JDRP as a reading program for grades 4-8.

DESCRIPTION Popular television scripts (*Brian's Song, Happy Days, Fat Albert, Here's Lucy, Kotter, Columbo, Star Trek, Something for Joey,* and *Toy Commercials*) are the texts. Cleared for use in schools, videotapes and matching lesson plans are used to build vocabulary, oral language skills, reading skills, writing skills, and the ability to handle complicated syntax. Teaching techniques provide immediate feedback and determine corrective measures. Extensive practice with sufficient modeling, leading, and testing is provided.

Students attend a Communication Studio three times a week. A studio is a separate room or a corner of a classroom. The group size ranges from 12-30. In a typical TV Reading period, students view a segment of a popular network videotape to aid in understanding the sophisticated vocabulary in the script (e.g., "meticulously, exasperated, pauper"). Actual viewing time in a 40 minute period is 3-7 minutes. In highly focused tasks that build understanding of word meaning and recognition, students master vocabulary in the script including camera, stage and actors' directions. Students become camera persons, directors, technicians, and actors as they confirm their ability to read at the end of each session by videotaping and playing back their dramatization.

Comprehension skills are taught using segments of videotape as a text, using the script, and transferring previously learned strategies to other reading materials. Comprehension skills are further practiced and tested using individualized commercially produced and teacher made follow-up. To increase the ability to gather and express information, students make a documentary choosing a topic related to the script they have been using. Such topics as "Getting a Bank Loan," "Heroes," and "Courage" have been chosen.

EVIDENCE OF EFFECTIVENESS Data were analyzed for students in grades 4-8. The average gain in NCE units was 8.5. Nationally used reading achievement tests of accepted validity and reliability were used. Disabled readers whose scores previously reflected cumulative regression, made dramatic gains.

IMPLEMENTATION REQUIREMENTS Three days of workshop training with a 2 day follow-up workshop after implementation are supported by 3 monitoring visits. Teachers and space to house a Communication Studio equipped with portable videocassette recorder, video camera, TV monitor, microphone on boom, chalkboard, and supportive materials are required.

FINANCIAL REQUIREMENTS Required training (can be shared with other adopters) and follow-up visitations cost $200 a day plus expenses. Package (tied to adoption) of single copies of videotapes, lesson plans, scripts, training manual, and reports is $250.

SERVICES AVAILABLE Awareness materials are available at no charge. Staff can attend awareness conferences. Visitors are welcome by appointment. Training at replication sites is available (costs negotiable) under certain conditions. Training at demonstration site is available.

CONTACT Mrs. Jacqueline Van Cott Barra, Project Director; Pennington/Grimes Center; 20 Fairway; Mount Vernon, NY 10553; (914) 668-6580, Ext. 363.

PROJECT 50/50

A regional computer program for underachieving secondary school students. Approved by JDRP for secondary school students who are underachievers.

DESCRIPTION Project 50/50 is a regional education/industry partnership using computers as a means of assisting underachieving secondary school students to gain computer application skills, and to increase their level of social functioning. Special emphasis is placed on the needs of ethnic minorities, females and disadvantaged youth. At least half (50/50) of the students served are from this population.

EVIDENCE OF EFFECTIVENESS In contrast to comparison groups, Project 50/50 students have demonstrated significantly greater acquisition of computer skills (as measured by the Computer Skills Test), self-esteem (as measured by the Tennessee Self-Concept Scale), and interest in math, science and technology (as evidenced by student schedules), based on a one-year intervention period. Following a four year plateau of achievement scores for math, reading and language, Project 50/50 students demonstrated significant gains compared to a norm group.

IMPLEMENTATION REQUIREMENTS Adopting school districts should provide five days of training time for the computer novice and three days of training time for the computer experienced teaching staff. One desk top microcomputer plus a printer are needed for every two students.

FINANCIAL REQUIREMENTS In addition to hardware costs, the cost for replication is $150 per pupil (n=100). Costs include an administrator to coordinate and supervise all program activities, and teacher and trainer preparation expenses.

SERVICES AVAILABLE Awareness materials are available at no cost. Visitors are welcome by appointment. Project staff is available for out of state awareness workshops (cost to be negotiated). Training is available for potential adopters at their home site or at the Oxford site, if more convenient. Training materials are available for teachers and students.

CONTACT Rob Richardson Director; French River Teacher Center; North Oxford, MA 01537; (617) 987-0695.

TRADE-OFFS

A television/film program to improve and expand economic education with major emphasis placed on teaching students to apply economic ideas in problem-solving situations relevant to their lives. Approved by JDRP for all students, ages 9-13.

DESCRIPTION Although economics is an important part of our daily lives, rarely has it made its way into the elementary curriculum. Project TRADE-OFFS has prepared visual lesson components, teacher guided materials, and inservice training in order to introduce elementary students to the concepts and applications of economics. Fifteen lessons, each 20 minutes in length, are available. The first four lessons deal with the economic fact of scarcity, and students learn a five-step decision-making model which helps them to develop skills in problem analysis and decision-making in both personal and social situations. Subsequent lessons address productivity and the market system. A Teacher's Guide is provided to facilitate classroom implementation and follow-up. Most of the suggested teacher techniques are highly flexible.

TRADE-OFFS can be integrated into mathematics, social studies, English, career education, or economics curricula, depending on the learning skills to be emphasized. Although lessons are primarily intended for use in sequence, they may be shown non-sequentially, again depending upon skills to be emphasized. Skills include using fractions, decimals, percentages, interest, and ratios; creating and interpreting charts, graphs, and grids; and problem analysis using the process of decision-making.

EVIDENCE OF EFFECTIVENESS Evaluation data show that TRADE-OFFS students do significantly better than students not exposed to the program when cognitive gains are measured by either project-developed criterion-referenced TRADE-OFFS Tests or the nationally normed Basic Economics Test. TRADE-OFFS material with inservice for teachers produces significantly greater gains than using the programs alone. Studies also show that student attitudes toward learning economics are improved.

IMPLEMENTATION REQUIREMENTS No special staff is required. Inservice training is not required, but evidence indicates that inservice is desirable. The basic inservice program provides a model for teaching each lesson, suggests economic activities to build an understanding of the economic concepts covered, and offers an opportunity to view selected programs followed by activities and discussion. Assistance may be obtained through the Joint Council's network of Affiliated State Councils and Centers for Economic Education. TRADE-OFFS can be adopted by individual teachers or for school or district-wide use. No special facilities are required except TV monitors, 16 mm projectors, or filmstrip projectors, depending upon format used.

FINANCIAL REQUIREMENTS Adopters may receive TRADE-OFFS programs via their local P.B.S. television station. Schools within the service areas of the stations should contact the station or state telecommunication agencies for broadcast and re-record information. Teacher's guides are available from the station or state agency. If purchased from AIT, they are $1 each. Users in consortium areas may purchase 16 mm color films for $190 per program or video cassettes for $94.50 per program from AIT. The set of sound filmstrips for $340 and the Workshop Leader's Handbook (for planning inservice activities) for $12 are available from JCEE. Information pertaining to consortium areas may be obtained from JCEE or AIT.

SERVICES AVAILABLE The Joint Council has a nationwide network of 50 State Councils on Economic Education and 240 College and University Centers for Economic Education, which provide curriculum development assistance to school systems. (Send for JCEE *Directory of Affiliates.*) State education agencies also provide limited assistance in areas where TRADE-OFFS has been adopted. (Send to AIT for TV contact persons in your state.) Awareness materials are available free upon request. Education Agency and Affiliated Council and Center personnel are available for on-site staff awareness meetings at no charge to adopter. Training services are available in many formats, most at little or no cost to users. When charges are made for inservice workshops, fees are negotiable.

CONTACT S. Stowell Symmes, Director; Project TRADE-OFFS; Joint Council on Economic Education; 2 Park Ave.; New York, NY 10016; (212) 685-5499. Or Roy Morgan, Director, User Services; Agency for Instructional Television; Box A; Bloomington, IN 47402; (812) 339-2203.

SECTION IV

NATIONAL DIFFUSION NETWORK STATE FACILITATORS

ALABAMA

Dr. R. Meade Guy
AIDS—State Facilitator
Alabama Department of Education
Room 607—State Office Building
Montgomery, Alabama 36130
(205) 261-5065

ALASKA

Ms. Gladys Foris
State Facilitator
Alaska Department of Education
Pouch F. State Office Building
Juneau, Alaska 99811
(907) 465-2841

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Computer Literacy Project Alma	29	computer literacy; intermediate grades; linking agents
Migrant Student Record Transfer System (MSRTS) Little Rock	40	elementary secondary education; information systems; migrant children; migrant youth; student records
California		
Calculator Math San Francisco	24	calculators; intermediate grades; mathematics instruction
California Lighthouse San Francisco	12	information dissemination; linking agents; networks; statewide planning
Careerways Los Angeles	25	career education; flimstrips; intermediate grades; linking agents; nontraditional occupations; television curriculum
Cupertino Concept: Computer Literacy Lighthouse Cupertino	16	computer literacy; microcomputers; school business relationship
Cupertino Concept: Computer Literacy Program Cupertino	33	computer literacy; elementary education; intermediate grades
Micro/Math San Francisco	39	computer literacy; intermediate grades; mathematics instruction
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Connecticut		
M2C: Math Motivational Centers Norwalk	51	computer assisted instruction; intermediate grades; mathematics instruction; remedial mathematics
Florida		
Calculator Assisted Mathematics for Everyday Living—CAMEL Daytona Beach	23	calculators; secondary school mathematics
Computeronics Tallahassee	31	academically gifted; computer literacy; intermediate grades; microcomputers; programing
RECIPE Lighthouse Sarasota	19	computer assisted instruction; computer managed instruction; management information systems; special education
Research Exchange for Computerized Individualized Programs of Education (RECIPE) Sarasota	44	basic skills; computer assisted instruction; computer managed instruction; elementary education; microcomputers; special education
Idaho		
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Mainstream Amplification Resource Room Study (MARRS) Norris City	38	auditory perception; elementary education; listening comprehension mechanical equipment perceptual handicaps
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Iowa		
Media Now Red Oak	52	intermediate grades; mass media; secondary education
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Cashflow Forecasting System Louisville	48	financial policy; information systems
Computerized Pupil Attendance Census System Ashland	50	information systems; student records
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Computer Assisted Instruction Lafayette	27	compensatory education; computer assisted instruction; elementary education; mathematics instruction
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Computer Assisted Instruction— Merrimack Education Center Chelmsford	28	compensatory education; computer assisted instruction; computer managed instruction; intermediate grades; linking agents; reading instruction
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CAM Lighthouse Hopkins	13	computer assisted instruction; computer managed instruction; data processing; management information systems; special education
Demonstration Evaluation Center (CAM) Hopkins	34	competency based education; computer assisted instruction; computer managed instruction; elementary secondary education

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Asbury Park Lighthouse Asbury Park	11	computer assisted instruction; computer managed instruction; management information systems; robotics; telecommunications
Communication Arts and Sciences Technology (CAST) Union	49	English instruction; secondary education; television curriculum; video equipment
Utilizing Computer-Assisted Instruction in Teaching Secondary Mathematics Asbury Park	45	computer assisted instruction; mathematics instruction; secondary education
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Computer Utilization in Education (CUE) Central Square	30	compensatory education; elementary education; intermediate grades; mathematics instruction; microcomputers; reading instruction
CUE Lighthouse Central Square	15	compensatory education; computer assisted instruction; computer managed instruction; management information systems
Individualized Prescriptive Instructional Management System for Underachievers (IPIMS) Union Springs	37	computer managed instruction; intermediate grades; reading instruction; secondary education
Mount Vernon TV Reading and Communication Mount Vernon	54	elementary education; intermediate grades; reading skills; television curriculum
Trade-Offs New York	56	economics education; instructional films intermediate grades; television curriculum

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Individualized Computer Assisted Remedial Education (I CARE) Orwigsburg	35	computer assisted instruction; mathematics instruction; microcomputers; remedial reading; secondary education; vocational education
Rhode Island		
Individualized Prescriptive Arithmetic Skills System (IPASS) Pawtucket	36	compensatory education; competency based education; computer assisted instruction; computer managed instruction; elementary education; mathematics instruction; microcomputers
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Microcomputer-Based Administrative Programs: Project Simu-School Dallas	53	information systems; library automation; management information systems; microcomputers
Utah		
Basic Literacy through Microcomputers Salt Lake City	22	computer literacy; elementary education; intermediate grades; microcomputers; reading instruction
Virginia		
Computer-Assisted-Diagnostic-Prescriptive Program in Reading and Mathematics (CADPP) Dillwyn	26	computer managed instruction; elementary education; intermediate grades; linking agents
Washington		
Vancouver Lighthouse Vancouver	20	computer assisted instruction; computer managed instruction; management information systems; school business relationship; telecommunications; volunteers

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